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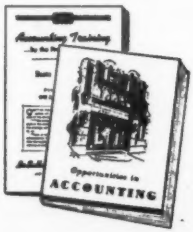

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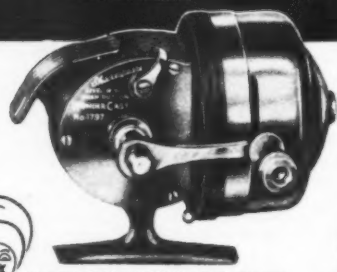

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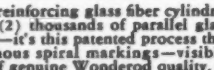

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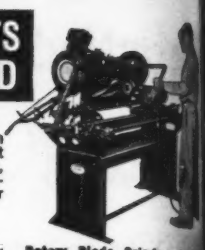

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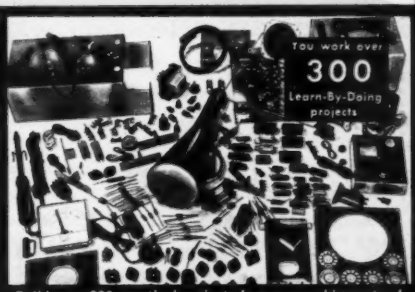

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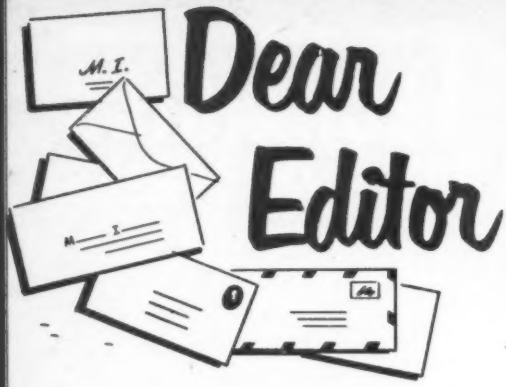

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In the November MI you advise a gentleman on how to build a smokehouse. The advice you gave him was of the old school. Possibly you are not aware of the method of converting a refrigerator, ice box, rocket shipping box (metal) or other tight metal container into a good serviceable smokehouse. Being lazy by nature, I find the prospect of getting out of bed during the night to feed a fire, and the prospect of maintaining a fire several days, quite distasteful. Therefore, by using a sheet metal pan resting on a hot plate and filled with dampened wood, I find that I can satisfactorily secure the smoke required.

C. C. Erven
Wilmington, Calif.

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I have a painting by Jean Corot called Dance Of The Nymphs that I would like to sell if it has any market value.

W. B. Ward, Jr.
Inez, Ky.

Any genuine Corot has market value and plenty of it. Of course, it must be by the Jean Corot who was a man, and who was also a Frenchman, and a very famous painter. Paintings by other Jean Corots are of sentimental value only. Write to the Metropolitan Museum of Art, Fifth Ave. & 82nd St., New York 28, N. Y., for an appraisal.

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N.C.
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Does it work! How do you think we get our answers to all these questions? You can buy a wee-gee board—or a Ouija board, as most people spell it—in most adult games departments of department stores. Our board tells us that Macy's, Herald Square, New York, carries Ouija boards, and that the Department of Parapsychology, Duke University, Raleigh, N. C., would probably give you titles of reliable books on the subject.

[Continued on page 23]

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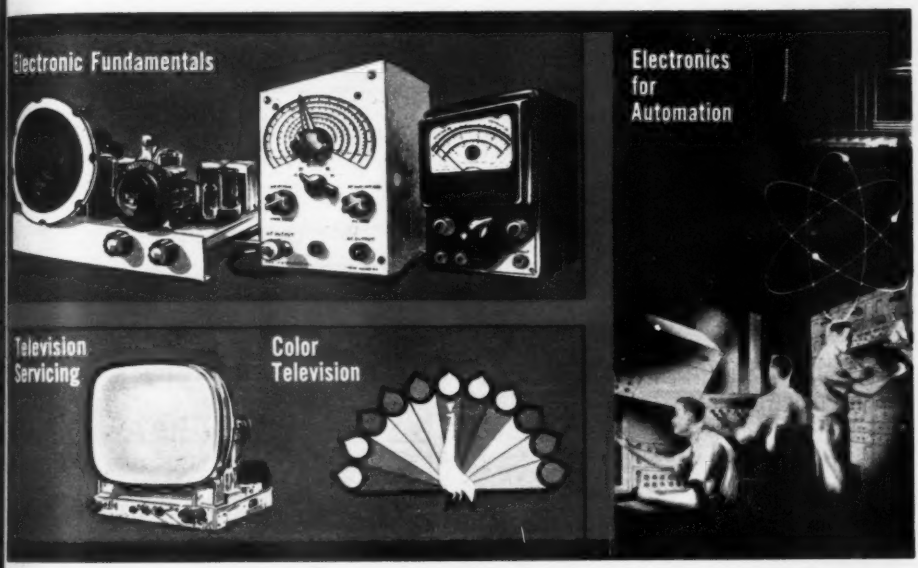

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A French Invention

This amazing lure was invented in France by a French sportsman who named it 'Vivif.' He spent years testing every possible kind of lure on fish and watching how they reacted to each lure under water! Who ever did that before? From those years of testing this Frenchman developed Vivif the patented lure with the 'Live' tail.

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Fish have never seen anything like this lure before. It attracts fish from far away by its vibrating tail that sends 'sound waves.' It is the world's most life-like lure in the water. Fish can't resist it . . . and when they grab the lure it "feels life-like" —doesn't warn them to spit it out before you can sink the hook in! Read this article and learn the amazing story of this imported lure.

Marvel of Design

Not just another stiff plastic or wood lure that "looks good" but doesn't work. Vivif is made of life-like latex and is the world's most life-like lure in the water . . . works better than live bait! Color combinations have been scientifically selected in actual tests. Perfectly balanced, Vivif doesn't spin . . . never twists your line. Acts and wiggles like a live minnow even on a slackened line.

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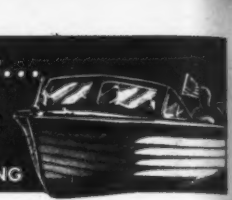

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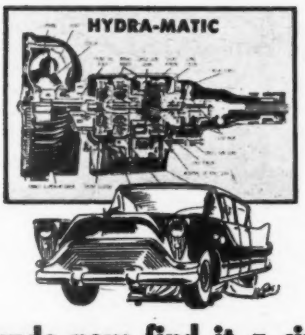

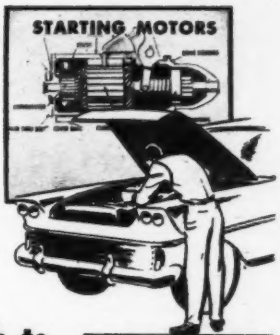

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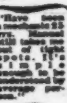

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Invention Clinic

Joseph H. Kraus

In this column each month Mr. Kraus will answer as many letters as space permits on those subjects he feels to be of widest general interest. Time does not allow him to reply to any letters except those printed here. Address your questions to the Invention Clinic, *Mechanix Illustrated*, 67 West 44 St., New York 36, N. Y.

Attention All Inventors

Perhaps the greatest problem the inventor faces today is that of finding a manufacturer. Ironically, the manufacturer who wants to add to his present line, or to diversify, has trouble finding the right inventor. There's a way out of this dilemma, however. A meeting of inventor and manufacturer is possible through one of the 53 field offices of the Research and Development Division of the Small Business Administration (SBA) or through its headquarters in Washington.

If you have a patent that was issued to you not more than seven years ago, and if you would like to have this listed for sale or license in the Products List Circular of the SBA, visit the nearest field office and ask for Form 312. On this form you may describe your invention in plain language in about 125 words. You can point out its favorable or unusual features, which rarely are given in your patent. Then you must add a copy of your patent which you can get for 25 cents from the Patent Office.

The Research and Development Division of the SBA will evaluate your invention and if it is thought suitable to small or even big business, it may publish your patent drawing and description in its monthly Products List Circular. There is no charge for this.

If you find it difficult to reach a field office of SBA, write a letter to Mr. D. Reynolds, Chief of Production Assistance Branch, Small Business Administration, Washington 25, D. C. and he will see that you get Form 312 and the instructions.

The identical steps can be taken by inventors who have applied for but have not yet been granted a patent. However, they must have a serial number from the Patent Office and must provide a clear copy of the patent drawing.

The printed story of your invention will not list your name and address; it will be identified by reference number.

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The SBA offers many additional aids to

[*Continued on page* 24]

INVENTOR'S TIP OF THE MONTH

THE man who develops a practical way to convert heat directly into electricity will probably just edge out several others who are trying for the same goal. This is the subject of much research, and there is a way to do the job in a laboratory demonstration: twist two unlike metals together, heat the junction and keep the free ends cool and an electric current will be produced. Turn this lab trick into an industrial process and fame and fortune are yours.

"Zero-five-seven...you are
fty feet above glide path...
ncrease your rate of descent...
ou are now on course, on
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oint...take over visually
or landing
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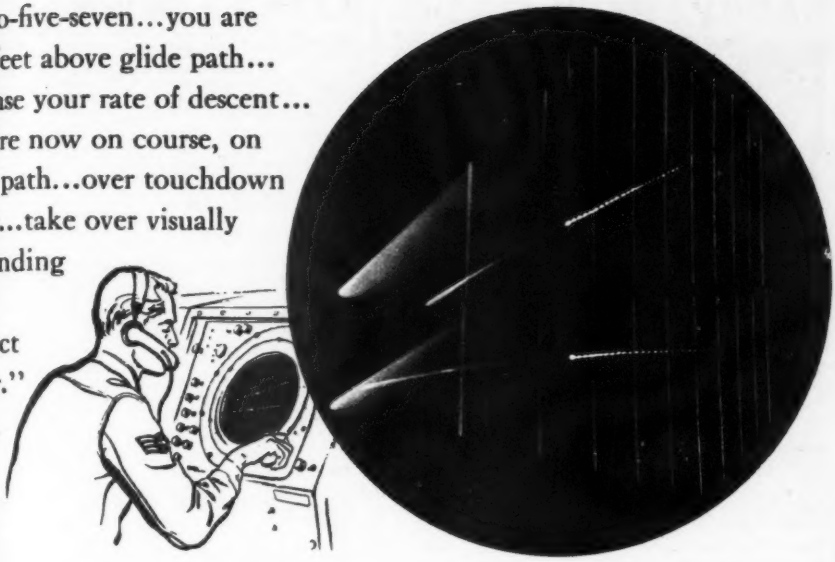

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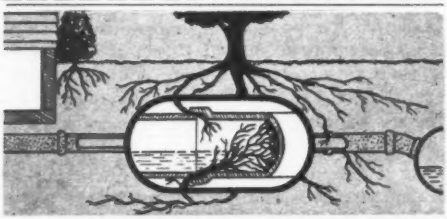

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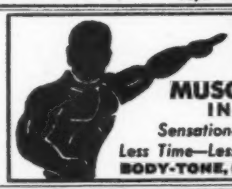

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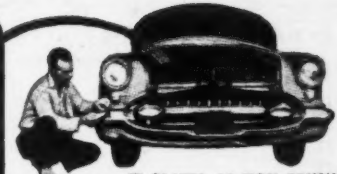

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Ugly scars may soon be prevented or erased chemically by an enzyme, according to Dr. John C. Houck of Children's Hospital Research Foundation in Washington, D. C. In addition to its scar-erasing and known cleansing activity, the enzyme is expected to aid surgeons in removing certain tissues that cause adhesions of the intestines.

A revolutionary new compound promises lifelong immunity for fabrics against textile-destroying insects which cause millions of dollars damage annually to carpets, upholstery and clothes. Entomologist Roy J. Pence at the University of California, Los Angeles, developed the compound.

An electronic computer, no bigger than a breadbox, is being developed by the U. S. Navy to give one man total control over the complex functions of a nuclear-powered submarine. The new system may permit reduction of atomic submarine crews from the present average of 100 to only 12 men.

A new method for converting foods into high-quality instant food powders is expected to expand markets for foods that can be adapted to the process. Known as "foam-mat" drying, the technique was developed by U. S. Department of Agriculture scientists.

Future American servicemen may receive psychological immunization against propaganda and brainwashing, as well as conventional injections for tetanus, typhoid, etc. Psychologists under the direction of professor William McGuire of the University of Illinois are attempting to develop such a technique.

Women will outnumber men five to two when normal life expectancy hits 100 years, predict doctors Edward L. Bortz of Philadelphia's Lankenau Hospital and Walter M. Bortz II, of Charity Hospital in New Orleans. One of the reasons, it is claimed, is that females can withstand more ailments than the dwindling males.

An antiseptic paint may soon be available for the home gardener's wounded trees. A fungus-killing chemical added to the asphalt varnish used in painting tree wounds prevents growth of damaging fungi, claims the U. S. Department of Agriculture.

Super-Supermart shoppers of 1975 will get to market by helicar, sashay through the aisles in a radar-equipped cartmobile and buy pre-shelled eggs in tear-open plastic boxes. This is the prediction of Ralph Ernst, store engineer and consulting architect of the National Association of Retail Grocers.

Colored bread may soon add a variety of hues to the family dinner table. One large English firm is currently experimenting with the idea and has baked loaves in yellow, green, pink, blue and also in multi-colored twists.

One day you may be able to look into your girl's eyes and tell how old she is. Biologist Rexford D. Lord, Jr., of the Illinois Department of Conservation in Urbana, can't yet tell a gal she's fibbing but he can tell an animal's age by analyzing its eye lens.

Ten years from now you'll be able to sit on a lawn that needs no mowing and reach up to pluck a normal-sized peach from the low branches of a dwarf tree, according to Dr. James A. Lockhart, biologist at the California Institute of Technology, who is doing research which would suppress the growth of plants without affecting their ability to flourish and yield normal crops.

Electronic machines may one day be able to tell why some children have difficulties in learning. That is the forecast of Dr. David G. Willis of Lockheed's Missiles and Space Division who has been experimenting in the field of creating "artificial intelligence" using electronic machines.

—*J. Robert Conner*

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Dear Editor

[*Continued from page* 10]

Mere Replacement Men?

One hardly knows who or what to believe. In Car Doctors Wanted (Jan. MI) author Stanley Brams says, "Don't be fooled by reports that today's mechanics (and, even more surely, tomorrow's) are and will be little more than replacement men." And where does one find this charge most often? Why, in Uncle Tom McCahill's articles, of course. Should we believe Old Chrome Dome or no?

George Bulkley
Irvington, N. J.

McCahill has said that many of those posing as auto mechanics are merely replacement men. Brams urges young men who want to make a career—and presumably an honest one—in this field not to think there is no more need for real mechanics. Surely Uncle Tom's complaint proves Brams' point rather than contradicts it.

A Use For Babies

The article Emergency Repairs in the Jan. MI reminded me of that summer night when my family of seven was stranded miles from home by a leaky radiator hose. A search of the car revealed no tape. Finally, my wife remembered that we had some waterproof material with us. This I wrapped tightly around the hose, securing it with a length of baler twine. Water from our picnic jug refilled the radiator, and soon the Studebaker brought us across the mountains to our home. The waterproof object? Why, the baby's plastic pants, of course!

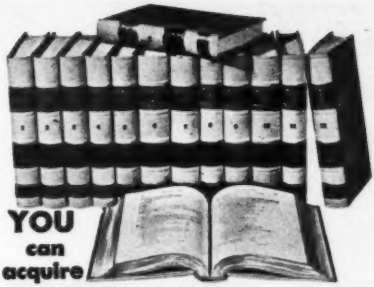
Floyd C. Spade
Wolfsville, Md.

Baseball Cards

Just read your article, Picture-Card Collecting Is Back! (Oct. '59 MI). Please tell me where I can obtain 1880 baseball cards and their price. Also send me the addresses of some of the "collectors' shops" that are near Southern Illinois.

Richard Cox
Fairfield, Ill.

Park Viewcard Service, Baden Station P.O. Box 11, St. Louis 15, Mo., specializes in postcards but may be able to steer you to another dealer in your part of the world who handles sport cards. Your best bet is to get a copy of The American Card Catalog ($2.50) from J. R. Burdick, 35 Madison Ave., New York, N. Y. The A.C.C. is loaded with American and English card dealers' ads. •



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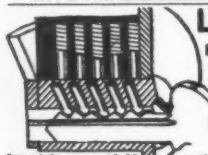

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Invention Clinic

[*Continued from page* 14]

small business, including financial assistance. If a manufacturer wants to expand or has other reasons for needing aid, he can seek help through an SBA field office. Inventors dealing with small manufacturers can point this out, if the manufacturer says he has no money for expansion.

So hop right to it, you inventors. Note: if you want to get the Products List Circular, please don't write MI. Send your request to Small Business Administration, Washington 25, D. C.

Pocket Knife Mechanism

Vito J. Pizzi of Bronx, N. Y., sends a design for an easy-opening pocket knife. Is this worth a patent search?

Very few housewives carry pocket knives, so it is unsound to produce one especially for them. Furthermore, there are many easy-opening knives which are not of the switch-blade or gravity type, with a much safer releasing system than yours. But perhaps you should give this whole idea some additional thought. There are many manufacturers of pocket knives who just might be interested in something really new and good.

New Use For Product

Clarence Phagen of Alexandria, Ind., has developed a new use for a commercial product. Can he get a patent on it? If not, how can he capitalize on this idea which might increase tremendously the sales of the present product?

You cannot patent a use for a product. You might be able to negotiate a contract with the manufacturer to the effect that he will give you a percentage on all of the additional sales if he accepts your idea and advertises it for the purpose you have discovered. Be sure to have your lawyer examine any agreement.

Toothpaste Tube Cap

Mrs. B. G. Underwood of Miami, Fla., sends a diagram and description of a fliptop tube cap. Is this good enough to deserve a patent?

It would have been if you had been the first to make such a cap. The identical cap is available for use on bottles.

Wire Clothes Hanger-Spreader

John D. Griffin of Kirkland, Wash., has a wire clothes hanger that will keep garments

part. Is it patentable?

This design is so simple that you easily could make a couple of samples and test them. In no time at all you would discover your hanger's demerits. It might be patentable but I certainly advise against wasting your money.

Answering Abacus Board

T. S. Swarts of Springfield, Ore., recently won a patent on an abacus with an answer section. What is the best way to get this on the market?

Preferably through a toy manufacturer specializing in educational toys or currently producing one or more models of an abacus. Check listings in the magazine Toys And Novelties or the annual Playthings Directory. Or try listing in the Products List Circular of the Small Business Administration.

Garage Door Opener

Claude Scott, Jr. of Louisville, Ky., describes a garage door opener which is operated through a key inserted into a post set on a level with the car window. What should he do about this?

There is nothing new about the post-key feature. This was one of many systems for opening garage doors which was described in these pages several years ago. However, if the price you quoted for a complete installation is correct, you must have something more than you detailed in your description. If you are sure of your costs and have included a profit, you may have something worthwhile.

Auto Tire

Len Johnson of Houston, Tex., submits a diagram and details for a new "special tire" for automobiles. Is it worth further examination? Would it work? Should he patent it?

You certainly should give this more study. There is every reason to believe that this design would work. The question is how well it will work, how much extra one must pay for this performance and how difficult it is to make this tire. I would not recommend patent procedure until you have learned a lot more about these problems. Many puncture-proof tires have been patented which never made the market.

Masking Tape Applicator

Eugene J. Silvestri of Venice, Calif., sends a diagram for his patent application for a de-

[Continued on next page]

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vice to make it easy to apply masking tape to automobiles prior to respraying. This is to be made in four sizes. Is there a market for the set?

This tool is similar to the binding tape applicators which are on the market now. The latter have the advantage of taking rolls of different widths. Something like this should be incorporated into your construction to avoid the need for making tools in four different sizes. Anything which will speed up the application of tape—especially if it will provide greater accuracy—should meet with a sale, if priced right.

Coffee Maker

Richard G. Eads of Walnut Creek, Calif., sends diagrams and description of a percolator-type coffee maker which gives a proper water-to-coffee ratio. A search reveals that this design probably is patentable. Will we give an opinion of its possible commercial merits?

The coffee-level-indicating mechanism is not enough to sell the percolator. You provide no regulating feature, hence the registering mechanism becomes rather ineffective. Cleaning is a problem and the cost considerable. There is no assurance that the system will continue to operate for a period of time. The first item likely to become defective is your measuring system. Even so, you must use a spoon or scoop to fill the top. We feel that the standard measuring spoon, or measuring cup, is a more simple arrangement. You have a lot more work to do on this item.

Scriber—Tap Remover

Roland E. Stanhope of Westboro, Mass., sends a design for a scriber. He also suggests an explosive method of removing a tap which has been broken inside of a valuable piece of work. What is our opinion of his ideas?

We see no advantage for your scriber over other tools used for the same purpose. However, we reserve the right to change this opinion if you send us additional information stressing comparative advantages.

Invariably, every thread cutting tap is harder than the material in which the thread is being cut. Any explosive charge great enough to shatter the tap will do much more damage to the work. You seem to have ignored possible injury to workers and the dangers resulting from storage of the explosives. Forget it.

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Captive Tube Cap

Seymour Epstein of Toronto, Quebec, Canada, sends a diagram and description of a captive cap to fit toothpaste tubes. What is our advice?

Use for an article is not a claim for a patent. You already know that this design is used on bottles. The present patentee has the right to make or license it for anything else—toothpaste, face cream, hair oil, shoe polish, salt and pepper, etc.

Paint Sprayer

A. J. Caillairet of New Sharpy, La., sends diagrams of a paint spraying system. So far as he knows, there is no such paint spraying equipment on the market. Should he try to patent it and get it on the market?

You cannot get sufficient air from the system you propose to produce a spray which will continue to operate for more than a fraction of a minute during each cycle. Entirely too much time is lost during the cycles. First you should be sure that your system will operate. Then you might consider patenting and marketing. Incidentally, this system is used in artists' small air brushes.

Head Rest

Raymond Zukor of Monticello, N. Y., has received a patent for a portable and adjustable head rest that can be affixed to an upholstered chair or used in a train, bus, plane or auto. It can be carried in a woman's hand-

[*Continued on next page*]

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bag. As it is made from a curtain rod and small hinges, should he redesign it before showing it to a manufacturer?

There is no reason to redesign the model as long as it gives a good idea of how it works and is attached. Every manufacturer will have his own thoughts about how the item can be adopted to his own production facilities.

Doweling Jig

R. W. Anderson of Los Angeles, Calif., sends photographs and description of a doweling jig which eliminates the need for marking. He feels that the jig would require too much instruction to sell well. What is my opinion?

Like your Justo-Stop for table or radial power saws, this tool has limited potential market. But a few simple cut-away diagrams giving progressive steps would make it possible even for those who cannot read to handle the tool expertly. •

PATENTS GRANTED

NO more zipper jamming, men! Silvan F. Goeser of Denison, Iowa, won patent 2,904,868 for his device which features a spreader bar across the top of the zipper slider that sticks out on each side. Thus, as you zip up or down, the overlying cloth is spread outward and upward, preventing jamming.

Future houses and offices may be made of bright-colored bricks that never need painting. Harley B. Foster, Greensboro, N. C., got patent 2,902,739 for his method of changing the natural color of brick, tile, etc. The ingredients are added to unfired brick and the final color becomes part of the brick and resists flaking under freeze-thaw conditions.

A violin hook which prevents the artist's instrument from taking off while he is performing a vibrato got Edward Sokolik of New Brighton, Minn., patent 2,902,895. The hook goes around the neck and is attached to the chin rest of the instrument.

Clinton O. Powell's toothbrush has a handle which is a pressurized capsule of tooth paste. As you brush the ivories, a valve in the handle is moved, squirting the dentifrice out through the openings near the brush bristles. The Norfolk, Va., inventor got patent 2,900,651.

Smelly movies may soon assault the nostrils of cinema addicts. An apparatus which permits the producer or film editor to select odor sequences suited to the action on the film was given patent 2,905,049 to inventor Hans Laube of New York City.

Do-it-yourself lads will like the paint roller with a fender devised by Carl F. Gaetke of St. Paul, Minn., which was granted patent 2,902,706. The splash-guard, or fender, is designed to catch paint slung off the roller when painting walls. It can also be adjusted to catch the drippings whilst one is dabbing at the ceiling.

A safety pin that sharpens itself during normal use won patent 2,904,865 for Paul W. Ziegenbein of Norfolk, Neb. The self-sharpening safety pin has a coating of abrasive on the inner and outer surfaces of the holder. This wears against the pin's point each time the pin is fastened or unfastened. •

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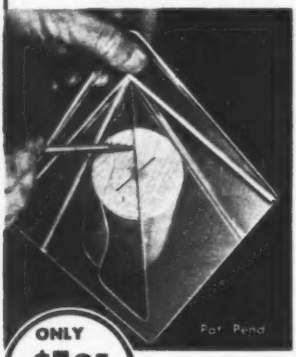

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VANDALS defaced this Tulare county, Calif. sign and Charles Iden's job is to catch them.

SIGN sleuth Charles Iden's beat extends over 3,000 miles of roads and it is his duty to protect the 18,000 traffic signs in California's Tulare county. The villains in this case are sign vandals.

Iden and two aides make up the sign detective bureau of the county's highway department. It was formed five years ago because the traffic sign mutilators were costing taxpayers too much money and endangering motorists' lives by defacing traffic signs.

Iden's toughest case involved a county-wide search for the "phantom truck" mob. These were a band of youths who used a pick-up truck with a special device that made them professionals in uprooting signs. Iden caught them with the aid of a farmer. Punishment consisted of making them re-install the signs that had been ripped out.

The drive to make driving safer in Tulare has been highly successful thus far; vandals now think twice before marring a traffic sign in the county. •

SCIENCE SHORTIES

ABOUT 18,500 Americans were killed by falls in 1958.

Tobacco, next to money, is the item most handled in the U. S. every day, being sold in 1,400,000 retail outlets in a variety of forms.

The increase in the number of psychiatrists in the U. S. from 8,713 in 1956 to 10,562 in 1959 now provides an average of one psychiatrist for every 16,400 people.

The world's greatest sugar consumers are Icelanders who averaged 134 pounds each in 1957.

In the first 200 miles a missile travels, the atmospheric temperature may drop 125 to 150 degrees.

Radars as large as a football field have been developed to detect ballistic missiles 3,000 miles away.

A single redwood tree may contain enough lumber to build 15 average homes.

Fleet truckers today average about 71,000 miles without accidents, compared with about 22,000 in 1948.

The flying squirrel does not fly but glides; glides of up to 125 feet have been recorded.

Every month the population of mainland China grows by more than 1,000,000.

If you keep bread at home for more than a few days, the best way to keep it fresh is to freeze it.

At the presently unattainable rate of 93,000 mph—the speed required to overcome the gravitational attraction of the sun—it would take three weeks to reach Mars.

Lightning kills about 500 Americans each year and injures another 1,500.

One out of every four persons in the U. S. is now attending school. •

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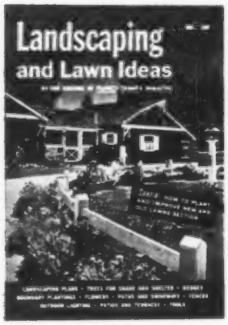

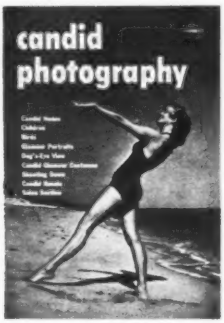

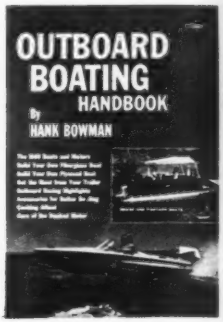

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CERAMICS by Vincent A. Roy; McGraw-Hill, New York City; 278 pgs.; $7.25.

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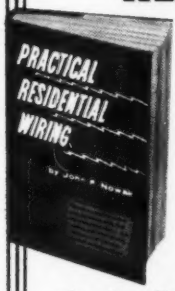

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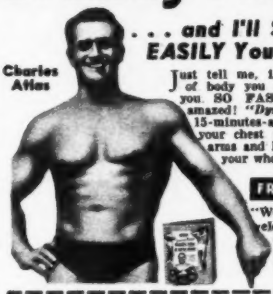

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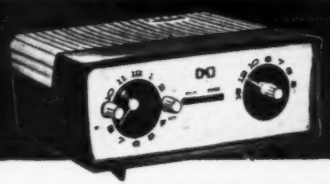

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ANY MODEL kit sent postpaid at 20% discount. Remit to Lakeview Hobby Supply, Box 607, Lynbrook, N. Y.

MODEL CARS, electrified roadways. Electromat Company, Box 13742, Dallas 24, Texas.

• • • PLASTICS

NEW LIQUID casting plastic, clear, colors. Embed real flowers, butterflies, photos, coins. Send 25¢ for two handbooks "How to Cast Liquid Plastics" and "How to Make Extra Money at Home." Castolite, Dept. D-104, Woodstock, Illinois.

LEARN PLASTICS Fabrication for spare time income. Low cost home training now available. Write for free booklet. Interstate Training Service, Dept. D-4, Portland 12, Oregon.

NEW, DO-IT-YOURSELF casting and molding Plastics! No Experience or Machinery Necessary. Send 25¢ for Big 64 page catalog. Castacraft Corp., Dept. A-33, P. O. Box 555, Palo Alto, California.

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VACATION EVERY weekend with compact camping trailer. Tent folds out to accommodate five—takes just one minute to set up complete camp anywhere! Wives love its neatness, roominess. Fully illustrated brochure free. Heillite Trailers, 1416 South Sacramento, Lodi, California.

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SAVE 80% ON Ammunition. Shoot tighter groups, score quick, clean kills, get more game. This "How-to" book gives you practical tips of thousands of top shooters. Order Bullet Handbook. Lyman Gun Sight Corporation, Box A, Middlefield, Connecticut. $2.00 postpaid.

CAST IRON Molds—For making your own fishing sinkers. Free Illustrated booklet. Reading Instrument Co., Box MI-78, Reading, Pa.

CROSSBOWS! HUNTING Bows! Factory Direct Prices! Jay Co., Box 1355, Wichita, Kansas.

NEW TYPE Stainless Steel Hooks, Samples 25¢. Conrad Carlson, Box 2011, Hanford, California.

5000 GUNS, SWORDS, War Relics. Catalog 50¢. Smith Armory, Runnemede, N. J.

• • • BOATS, OUTBOARD MOTORS

FULL SIZE, cut-to-shape boat patterns, blueprints, 7½-38 feet. Big new 88 pg. illustrated "Build a Boat" Catalog of Naval architect-designed Catamarans, Cruisers, Runabouts, Skiffs, Outboard Boats, Sailing, Racing, Houseboats, 50¢. "How to Build a Boat" Booklet, $2.50. Equipment Catalog, $2.00. Cleveland Boat Blueprint Co., Dept. A-23, Box 1651, Cleveland, Ohio.

CATAMARAN. A novel bipod mast is one of the outstanding features of King Kat, a 12-foot, all-plywood cat. The easy-to-follow-plans include large-scale drawings and full instructions for the amateur boatbuilder. Send $3.00 to MI Reader Plan Service, Fawcett Place, Greenwich, Conn., and specify Plan No. B-230, King Kat.

MARINE CONVERSIONS. Ford, Chevrolet V8, Jeep engines. Catalog 25¢. Lehman Manufacturing Company, 800 Elizabeth Ave., Linden 3, N. J.

NEW, USED rebuilt marine motors. Marine conversions, fittings. Free catalog. Stokes Marine Supply, Dept. 21, Coldwater, Mich.

SAVE! SAVE! Save! World's Finest Boat Kits—25% less! Satisfaction Guaranteed! Write for free color catalog. Dept. MIM-460, Taft Marine Woodcraft, 636 39th Ave. N. E., Minneapolis, Minnesota.

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FRAME KITS, Plans or full-size Patterns for 35 Inboards and Outboards. Prepared for Amateur Builders. New 80 page illustrative catalog—50¢. Designs, 9152 Rosecrans, Bellflower, Calif.

MI Classified Advertisements

FOR SALE reconditioned outboard motors 2 hp. to 25 hp. All makes and sizes at bargain prices. Zaloudek Implement Company, Enid, Oklahoma.

SAILBOAT—PLASTIC hull, sail, aluminum mast & fittings. Can't sink or swamp. Complete $99.50. Write Nautical Plastics Co., P. O. Box 930, Camden 5, N. J.

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BUILD YOUR own Reflector Telescopes. Complete Kits: Mirrors, Eyepieces, Tripods, All Other Accessories. Request Free Illustrated Literature. Criterion Manufacturing, Dept. KM-62, Hartford, Conn.

TRIPOD PLANS. Unless you have a sturdy support for your telescope it will be virtually useless for good observing. For best results build MI's "Quarter-Ton" Tripod. Send 75c for plans and instructions to MI Reader Plan Service, Fawcett Place, Greenwich, Conn. Please ask for Plan No. P-7.

WAR SURPLUS Bargains: Millions of lenses, instruments, telescopes, binoculars, components and complete line of astronomical telescope items. World's greatest optical market-place! Send only $1.00 for beginner's 10-lens Kit and big Instruction Booklet Stock 2-CB. Write for Catalog "CB," Free! Edmund Scientific Co., Barrington, New Jersey.

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DYNASCOPE—AMAZING World-Famous Reflector Telescope. Request Free Brochure. Criterion, Dept. DM-80, Hartford, Conn.

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DEADLY ORIENTAL Fighting Arts. Illustrated elemental Karate Kung-Fu manual $3.98. Training with breath, straw, peas, pebbles, etc. Break planks barehanded. Oriental Book Sales, P. O. Box 1183, Oakland 7, Calif.

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• • • REAL ESTATE, FARM LANDS

FLORIDA LOT Bargain! Only $149 Full Price! (for limited time). No Money Down—$5 per month. On US #441-27 between Ocala and Orlando. High and dry. Hard surface streets, electricity, phones, schools, churches. 3000 fishing lakes closeby. Write for Free photos. Dept. 215A, Orange Blossom Hills, Box 1222, Leesburg, Florida.

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FLORIDA HOMESITES $395. No Money Down! Lovely ¼ acre sites in Central Florida hills, lake, grove area $395, no money down, $10 a month. Suburb of Ocala, near Silver Springs. Streets, utilities. 22 mi. to Gulf Beaches. Fish, hunt. Invest or retire. Free color folder. Write Dept. 617-H, Rainbow Park, Box 521, Ocala, Fla.

FLORIDA—NICE homesites, $345 at $10 monthly. Folder Free. Winston Vernor, DeLand, Fla.

FLORIDA—SILVER Springs Area. ¼ acre waterview homesites. $795.00, $10.00 month. Free color photos. Write Smith Lake Estates, Box 568D, Belleview, Florida.

• • • PLANTS, SHRUBS & TREES

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• • • HORSE TRAINING

"HOW TO Train Horses"—A book everyone who likes horses or ponies should have. Free. No obligation. Simply address Beery School of Horsemanship, Dept. 1154, Pleasant Hill, Ohio.

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RAISE RABBITS Successfully By Knowing Facts. 48 page illustrated book describing 25 breeds, Housing, Feeding, Breeding, Marketing, etc. Plus Bulletin, 25¢. American Rabbit Association, 83 Arba Building, Pittsburgh, Pa.

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LOANS BY Mail. $50 To $600 For Any Purpose. Employed men and women eligible. Confidential. 2 years to repay. Write for free loan application. American Loan Plan, City National Bldg., Dept. M-3230 Omaha 2, Nebraska.

MEXICAN LAW. Attorney Ceniceros, Apto 79.—C. Juárez, Chih., Méx.

BORROW $100 TO $600 By Mail. Quick, Easy, Private. No Co-Signers. Repay in 24 small monthly payments. For the amount you want write today to Dial Finance Co., 410 Kilpatrick Bldg., Dept. D-1, Omaha 2, Nebraska.

BORROW BY Mail. $100-$600. Anywhere. Air Mail Service. Postal Finance, 200 Keeline Building, Dept. 18-E, Omaha 2, Nebraska.

"RULE OTHERS with thoughts." (Telepathy.) Write: Clarion, Box 9309-59, Chicago 90.

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COSTUME JEWELRY Supplies, Settings, Rhinestone, etc. 88 page illustrated catalog. 30¢. Milady, Box 1328, G.P.O., N.Y.C.

FREE CATALOG. Costume jewelry parts. Supplies. Reasonable prices. Fast service. Guaranteed quality. Unique merchandise. Folsom's, Box 52, Medford 55, Mass.

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BOSTON REMAILING 5¢-20¢. Details Free. Selby Service, Box 12-N, Chestnut Hill 67, Boston, Mass.

SECRET MAIL Receiving-Forwarding System. Hedgpeth, Box 830, Alhambra 17, California.

• • • MISCELLANEOUS

ORNAMENTAL IRON designs. Book of 1600 beautiful, practical designs for railings, columns, lets intra-red thru. Cunningham. 3881 So. 3200 West MI-14, Salt Lake City 4, Utah.

NITE DRIVING Glasses, improve your driving. Not sun glasses, but scientifically improved, lets intra-red thru. Order today clip-on style $2.95, regulars $3.95, delux $5.00. Herm Roth, 202-I Pickrelltown, West Liberty, Ohio.

HOMEBREWED BEERS and malt liquors. Formulas and instructions $2.00. "How To Do It" Industries, 3406-D North Interstate, Portland 17, Oregon.

FREE WHOLESALE Catalogs! 250,000 Products . . . Tremendous Discounts! Econ-O-Mart, Whippany 8, N. J.

END MISPLACING Keys: Key Rack $1.00. Leonard Brooks, 835 Connecticut Avenue, Bridgeport 7, Connecticut.

"WINEMAKING; BEER, Ale Brewing." Methods, recipes. Illustrated. $2.20. Eaton Books, Box 1242-Z, Santa Rosa, California.

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GET FREE Catalog no serious rockhound, gem cutter, jewelry maker, hobbyist or craftsman can be without. Full of bargains, exclusive items, low prices from largest suppliers and authorities in the field. Free . . . new catalog just off the press — yours for the asking! Write Grieger's, Dept. C-4 1633 E. Walnut, Pasadena, Calif.

• • • OLD GOLD WANTED

HIGHEST CASH Paid For Old Gold, Jewelry, Gold Teeth, Diamonds, Watches, Silver. Mail Articles Today. Information Free. Chicago Gold Refining Co., 6 E. Monroe, Dept. 1956, Chicago 3.

HIGHEST CASH For Old Gold, Jewelry. Gold Teeth, Watches, Diamonds, Silverware, Spectacles, Platinum, Mercury. Free information. Rose Refiners, Heyworth Bldg., Chicago 2.

• • • WATCHES, WATCHMAKING, CLOCKS

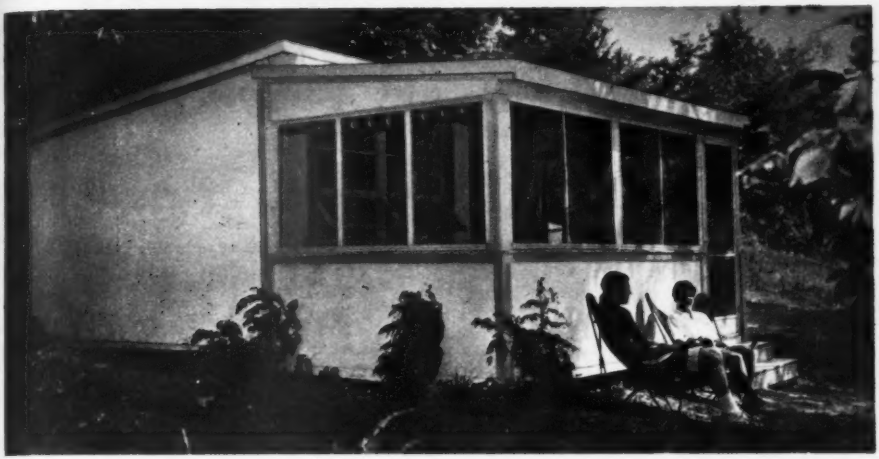
WATCHMAKERS', JEWELERS', Lapidaries' Catalog 25¢. Bengal, 8914 Venice, Culver City, California.

SWISS WATCHES, wholesale, literature. Herm Roth, 202-2 Pickrelltown, West Liberty, Ohio.

USED AND new watches $2 up. Free List. Southern Watches, 5-M South Wabash, Chicago 3, Ill.

WATCH AND clock repairing books. Free catalog. North American, 2320-CR Milwaukee, Chicago 47, Ill.

BUILD A MODERN VACATION HOME



PLANS ARE AVAILABLE for this inexpensive summer retreat. The main cabin, which is 12'-4"x14'-4', can be built for only $275! An 8'x14'-4" porch can be added for little extra cost and even further expansion is quite simple. Why not order complete plans now? Just send $2.00 to MI Plans Service, Fawcett Bldg., Greenwich, Conn. Please specify Plan No. HJ-30, Summer Cabin.

More For Your Money! Who said inflation makes everything cost more? Don't believe it! You can still get two full years of MECHANIX ILLUSTRATED for only $5. That's a $6 value and saves you a dollar. To take advantage of our offer just fill out the coupon below and mail it today. Send no money. We will bill you later.

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CITY ..... **ZONE** .... **STATE** .....

Mail to:* MECHANIX ILLUSTRATED, *Circulation Dept., Fawcett Bldg., Greenwich, Conn.

Light plane record holder uses Champions! Max Conrad set a new endurance record for single-engine, light planes last June . . . 7,668 miles non-stop! His Lycoming-powered Piper Comanche was sparked by Champions.

Outboard record holder uses Champions! Hugh Entrop holds the world's outboard motor record with a dazzling 107.8 miles per hour. His stock Mercury outboard was powered by Champion spark plugs.

Land speed record holder uses Champions! Mickey Thompson set a new American speed record of 363 m.p.h. at Bonneville Salt Flats last October. His car's four Pontiac engines were all sparked by Champions.

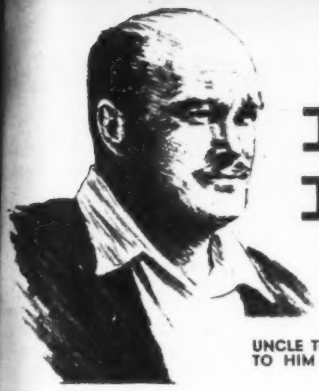
Indianapolis record holder uses Champions! Rodger Ward set a new record at Indianapolis last year at 135.8 miles per hour. Rodger, like 9 out of 10 race car winners, uses Champion spark plugs!

Q. Why do the record breakers, in field after field, use Champion spark plugs?

A. Because they know they can depend on Champions to wring every bit of performance out of every drop of gas. Your car will perform better, too (and save money on gasoline) with new Champions. Put in a set every 10,000 miles!

Worn spark plugs waste lots of gas— so check your plugs every 5,000 miles!

CHAMPION



MAIL FOR McCAHILL

UNCLE TOM ANSWERS HIS MOST INTERESTING LETTERS IN THIS COLUMN. WRITE TO HIM AT *MECHANIX ILLUSTRATED*, 67 WEST 44TH ST., NEW YORK 36, N. Y.

● *In a recent mail column you expressed an interest in the origin of the word "Boji"* (The name of Uncle Tom's Labrador retriever—Ed.). *Perhaps the following will help: The Boji were a Frankish-Germanic tribe living in the north of France before the beginning of the Christian era. It seems they migrated eastward and settled in the valley of the Moldau in the general vicinity of the present city of Prague, or possibly in the vicinity of Brunn. Europe was then very sparsely populated. A Slavic people, the Czechs, were pushed westward by the invading Huns and settled in the unoccupied areas of the land held by the Boji. Just how your dog connects with this I must leave to you and him. I can only hope he is a good pooch.*

A. J. Herbolsheimer, M.D.
Livermore, Calif.

"Boji" means "Scared Stiff" in Slovak. Ha!

Rev. John L. Matovich
St. Cyprian's Church
Wyandotte, Mich.

After reading Fred Drake's letter about the name "Boji" in the November mail column, I thought I'd see about helping you out. I talked to Mr. Taubert (Boji's breeder) and asked him about the name. He told me he just makes these names up so the dog can be registered. The name has no particular meaning or origin.

Arthur Hazel
Fargo, N. D.

You just loused up a lot of good research, Arthur, but thanks.

● *I believe you will be interested in an accident which I had in Colorado last winter. It had been snowing lightly and getting icier all the time. I would occasionally try my brakes and I seemed to have good control of the car. But I went around a particularly icy curve and the rear of my car started flipping back and forth. I had made the mistake of staying in overdrive and when I let up on the gas, the compression of the motor naturally did not have any effect. Just as I got around the curve I saw a snow plow coming at me fast and at close range. I couldn't pull out on my side of the road as there was a drop-off into the river. So, remembering in a flash things that I had read in your articles—Number One of which was to avoid a head-on accident at all costs—I spun the car to the left so that I would go skidding into the snow plow's blades. This, I figured, would reduce my forward speed. I also remembered that you had stated that you should take a crash with your head and body below the instrument panel. So just as I whipped the wheel I "dove for the cellar." The car was banged up pretty much but I came out of it without a scratch. Thanks for the good advice which you put into your articles.*

Floyd I. Galway
Salt Lake City, Utah

Glad my articles helped you out of a rough spot. Many a guy could be saved if only he knew what to do when the going gets tough.

● *In the November issue I read where Ed Lothrop was having trouble with the rear window becoming dirty on his '59 station wagon. I remedied that problem on my wagon by cutting a piece five feet long and ten inches wide from a heavy conveyor belt. I bolted this piece to a strip of angle iron, then bolted that to the end of my car's frame, giving me a mud flap all across the back of my wagon. Went from Texas to Maine without having the rear window get dirty. Also, I've never had fumes in 61,000 miles of driving with this rig.*

T/Sgt. Bob Farnham
New Braunfels, Tex.

We hesitate to print this letter as half the

[*Continued on next page*]

factories in America may come down with mutilated conveyor belts, but it sure sounds like a good idea.

● *I bought a copy of your great new book, Today's Sport And Competition Cars and read on the jacket that you had "survived over 200 auto performance tests." On your old book, The Modern Sports Car, which I bought over five years ago, it states the same thing. What have you been doing for the last few years—loafing?*

F. T. Morrel
Dayton, Ohio

The guy who edited the new book jacket goofed. It should have read "over 400" and if all the additional commercial tests were included it would be closer to 600. However, whether I survived or not is purely a matter of opinion.

● *In Mail For McCahill of November 1959 you said that the Canadian Ford Product "Monarch" is called Richelieu for the remembrance of "The hardest-hitting Cardinal since Stan Musial." Believe me, you are way off! "Richelieu" is the name of the river which goes from St. Lawrence River in the province of Quebec, Canada to Champlain Lake in New York and Vermont, U.S.A. I hope that you will correct your statement and that* MECHANIX ILLUSTRATED *will continue to stay the publication of exact facts.*

Gilles Lafreniere
Montreal, P.Q., Canada

Who do you think the river was named after, Gilles—Duke Snider?

● *I recently became the proud (?) owner of a 1928 Imperial rumbleseat roadster and like anyone else who is about to attempt to restoration of an old car, I'm badly in need of information. I wonder if it would be possible to state in MI that I'm interested in obtaining whatever information I can get on 1928 Chryslers and Imperials? If this request cannot be handled through you, perhaps it could be handled through the Dear Editor department.*

John Bemis
Hamilton, N. Y.

Let's not wake the boys up, John; we'll run it here.

● *I have a problem. I recently bought a "Michigan Monster" (as you say) sedan. It's just too wide to get into my 1928 garage. I can get it in, but once in I can't open the car*

[Continued on page 50]

They all know the Superiority of AMALIE OIL

Sports car enthusiasts know the value of a superior motor oil. Because their cars are tuned and balanced exactly, each owner demands a lubricant that will match this exactness.

Amalie Motor Oil is an exact lubricant. Our refining process is gentle and slow, under special controls that keep refining temperatures low. It is an expensive method but it protects all of the precious lubricating quality naturally present in Pennsylvania Crudes.

Next time you need an oil change, look for the Amalie sign . . . at better dealers everywhere.

For a look (and a chuckle) at the Automobile World circa 1909, write for FREE reprint of 28 page booklet "HINTS." You'll be amazed at the repair remedies that every 1909 driver had to know.

AMALIE DIVISION, O-4, Sonneborn Chemical and Refining Corp., Franklin, Pa.

"I 'built' my Chevy as a trailbreaker."

"That's my office there in the picture, you might say. I'm a conservation officer, and I spend most of my time patrolling my beat—four hundred square miles of wilderness, with darned few miles of road in it. Takes a real man-sized car to haul me and my equipment around. I talked it over with a Chevrolet dealer a while back, and when he pulled out that tremendous list of options—well, here's what I'm driving now:

"A Nomad station wagon, as you can see. Four doors, six passengers, plenty of space for gear—a beauty, isn't she? Under the hood, there's that 230-horse Super Turbo-Fire V8*. I teamed it with the standard three-speed transmission. You just don't find a tougher pair than that, or one that's quicker to answer. I wouldn't pass up Positraction,* of course, for pulling through the gumbo that comes up around here after a rain. Heavy-duty clutch* and rear coil springs,* seat belts* and a compass* finished this baby off fine.

"This, friend, is all car, and it won't quit no matter how hard I push it. And the best part of it is it's all mine, with all the things I want in a car."

You can do your own "building," you know, with Chevy's long-as-your-arm list of options. Sports car, family car, luxury car—you name it, you can create it. Right now, we'd suggest a trip to your Chevrolet dealer's. . . . Chevrolet Division of General Motors, Detroit 2, Michigan. **Optional at extra cost.*

CHEVROLET

Whatever sort of car you'd like your car to be, there's a Chevy package that'll fit you like a glove. Seven perky engines . . . five transmissions . . . special cams . . . solid or hydraulic valve lifters . . . dozens of heavy-duty and comfort and convenience features . . . you've got some really pleasant choosing ahead of you!

[Continued from page 48]

door to let myself out. Any suggestions?

Carl Powell
Newark, N. J.

The only hope I can see for you is to trade in your sedan for a convertible. Then, with the top lowered, you can climb up and slide down the back deck. Or buy a compact car.

● *We have a chap in our shop who owns a Kaiser. He claims to get 28 miles per gallon on runs between L. A. and Morro Bay, Calif. This we can buy—it is possible—but he also claims that on Angeles Crest Highway (a mountain road) he really waxes Chevy Impalas, Ford wagons and any other car that is willing to try him.*

Charles H. Pratt
Sun Valley, Calif.

He must mean on the way down. The last Kaiser that started through the measured mile at Daytona Beach hasn't made it yet.

● *I would like to know your opinion as to the best method of tire balancing.*

G. R. Tyrrell
Seattle, Wash.

The best way is: first balance the wheel and tire *off* the car; then, with other types of balancing equipment, *on* the car. Bear in mind it is a waste of money to have any wheel balanced until the tire has gone 500 miles.

● *A couple of weeks ago I bought a new 1960 Pontiac and have a problem. Rarely do I find a service station operator who knows how to find hood release. What's the game?*

Harry F. Slattery
Jacksonville, Fla.

The game, invented by Bunkie Knudsen and his Brownies, is called "Hide The Hood Release."

● *After seeing all the 1960 cars my annual complaint is the same. Lots of garage-filling room but meager interior space for people with heads.*

A. H. Stewart
Hayward, Calif.

Many Detroit firms have proven that heads are not an important part of the average driver.

● *In 1957 or so the Mercury automobile came equipped with a radiator fan that*

[Continued on page 52]

Gone fishin'...on a HARLEY-DAVIDSON TOPPER

HARLEY-DAVIDSON MOTOR CO.
Dept. MI, Milwaukee 1, Wisconsin
Send me more information on the Harley-Davidson Topper.
Name.....Age.....
Address.....
.....

Angling for your favorite trout stream is twice the fun on a Harley-Davidson Topper. Plenty of room in this scooter for meal and creel, too. Fishing is just one of many activities that give more pleasure because you get there on a Topper.

The Topper boasts a host of new scootering features developed by the world's leading builder of 2-wheeled vehicles—see it at your Harley-Davidson dealer or mail coupon for colorful folder.

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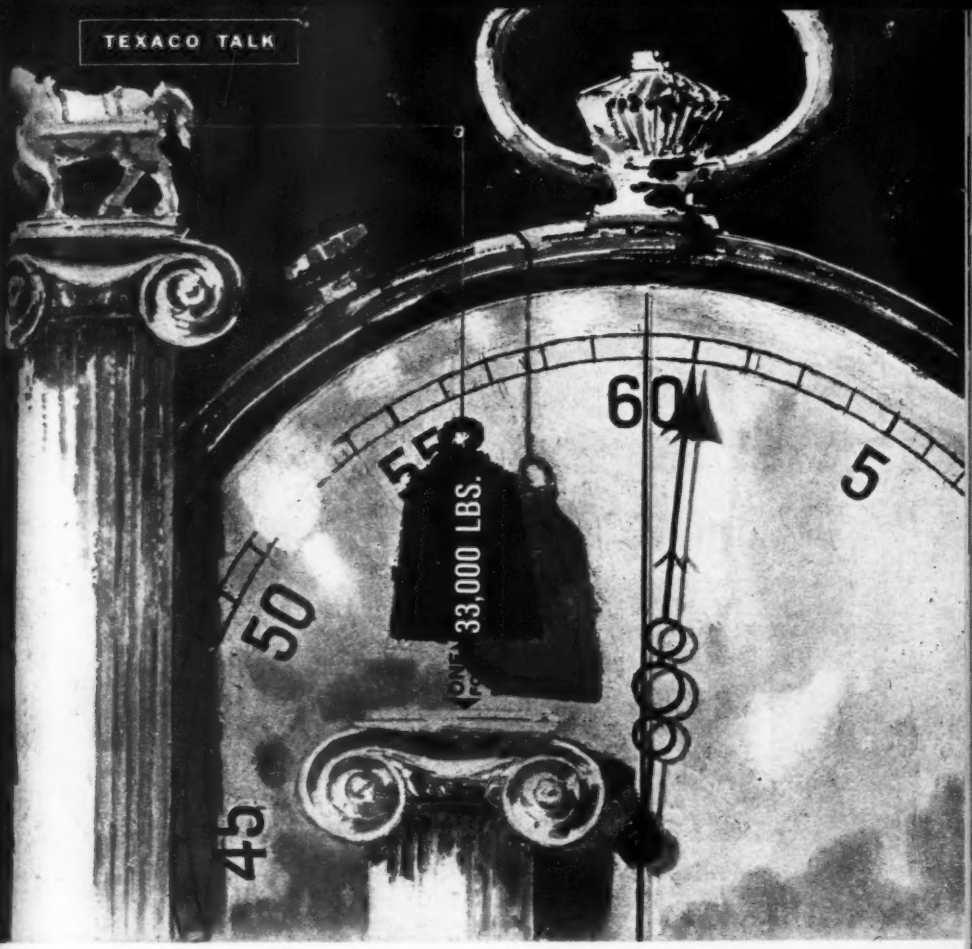
TEXACO TALK



What horsepower really means

James Watt, the inventor of the steam engine, determined that a husky horse could lift a weight of 33,000 pounds one foot in one minute. He called this horsepower.

Automobile manufacturers later adopted what they call *brake* horsepower—so named because they used a brake on the flywheel of the engine to measure horsepower. The method of measuring brake horsepower has undergone changes over the years, but the term is the one in everyday use.

Brake horsepower simply means the developed power that's actually delivered at the engine's flywheel and therefore available to drive the car's wheels. The average American compact car engine has about 90 "horses," while the most powerful American car engine has about 350.

Be sure to get all the power your engine can develop. Your Texaco Dealer has two great gasolines for your driving needs: top octane Sky Chief Su-preme, with Petrox... or famous *regular-price* Fire Chief. You drive with more pleasure and save for good measure, at Texaco's Tower of Power.

TEXACO

Buy the best . . . buy TEXACO

TUNE IN: TEXACO HUNTLEY-BRINKLEY REPORT / MONDAY THROUGH FRIDAY / NBC-TV

NO TIME FOR A BIG CIGAR?...

JUST TIME FOR A TREND MILD LITTLE CIGAR ↓

Humidor pack of 20 **35c**

Nothing smooths rough going as fast as a Trend Little Cigar. They're long enough for complete satisfaction . . . short enough to enjoy *anytime*. 100% cigar tobaccos clear through, including all tobacco, Trend-Air Conditioned wrapper. *And you need not inhale to enjoy them! Mild . . . try a pack today.*

NOW . . . TREND-AIR CONDITIONED FOR MAXIMUM MILDNESS . . .

Scientifically placed, microscopic air-inlets "breathe" just the right amount of cool air into the smoke stream to give you the mildest, freshest smoke you've ever tasted in a cigar.

STEPHANO BROTHERS (Cigar Division) Phila. 7, Pa.

PIONEERS IN MODERN CIGARS

Mail For McCahill

[*Continued from page* 50]

became a free-wheeling unit at 40 mph, when the fan is no longer needed. Claims were made that this device would increase the performance and economy of the car while making it run quieter at speeds of 40 mph or greater. Several auto stores now offer this fan for installation on all makes of cars for about $30 to $40. If the claims are justified, wouldn't this be a worthwhile addition to one's car?

Bernard Greenberg
State College, Pa.

Thirty or 40 bucks will buy an awful lot of

[*Continued on page* 54]

...extends Spark Plug "PRIME OF LIFE"

Comparison Proves Special Duty Advantages

The usual extended tip spark plug (left) has a long ground electrode that can burn or wear away under severe operating conditions.

The new AC Fire-Ring Extended Shell Spark Plug has the short, sturdy ground electrode design that reduces vibration, burning and breaking off, assures superior performance.

Every AC Fire-Ring Spark Plug features the exclusive Hot Tip that heats faster, cools faster to stay clean longer.

They must be the best!

AC FIRE-RING SPARK PLUGS

Here's the newest of the new for car owners requiring extended tip spark plugs — an *extended tip* spark plug with an *extended shell.*

This revolutionary new shell design offers all the advantages of the extended tip design, plus greater efficiency during the spark plug's peak power period — or "Prime of Life." It permits a shorter ground electrode that reduces power-robbing misfire and electrode wear. It fully protects the insulator tip to shield it during starts and prevent "drowning," after false starts.

You get faster, surer starts and cleaner burning full power performance throughout the entire life of the spark plug.

If your car calls for extended tip spark plugs, ask for this newest development — new AC Fire-Rings with *extended* shell.

AC SPARK PLUG ✿ THE ELECTRONICS DIVISION OF GENERAL MOTORS

AC PRESENTS THE ART CARNEY SHOW, NBC-TV, April 8

[*Continued from page* 52]

gasoline. However, this wasn't an original idea with Mercury. Wills-St. Claire featured it over 35 years ago. The average fan does rob about ten horsepower at 75 mph and is a gas burner. After 50 mph it can actually slow down the flow of air that would reach the engine without it. I've driven coast to coast on several occasions without a fan. But when you hit big city walking-speed traffic, things can get real sticky even in mid-January. Cars operated out in the open country in cold climates all the time can certainly save money by just taking the fan blades off during the winter months, providing the blades aren't welded or riveted.

● *I wonder if you could settle an argument between me and the gang at the local gin mill? I say that a cold engine should be warmed up to full operating temperature before being used to pull the car. The opposition claims that an engine should be driven under 30 mph until full temperature is reached.*

Dan Valenti
Rockaway Beach, N. Y.

Personally, in real cold weather I like to let the engine run several minutes before slipping it into gear.

● *Guess you've been asked thousands of questions and—well, brace yourself we here's one more: What has happened to your tresses?*

Matti Fors
Saaminki, Finland

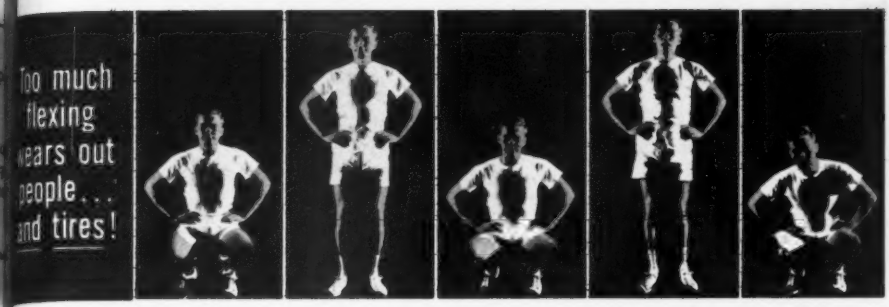
Nothing. All six are still there.

● *I've just bought a 1946 Ford convertible which is in beautiful condition. If you have any literature at all on this model, specifications, test reports, repair manual, etc., I would very much appreciate a way to obtain such.*

Warren Bausert
84 Maplewood Ave.
Selden, L. I., N. Y.

The first car I ever tested in these pages was a 1946 Ford, in the February 1946 MT. Frankly, I haven't any old copies but any top-flight garage that's been in business more than a year or two will undoubtedly have an

[*Continued on page* 56]



New *"Low Profile"* tire shape flexes less, reduces heat build-up, increases mileage!

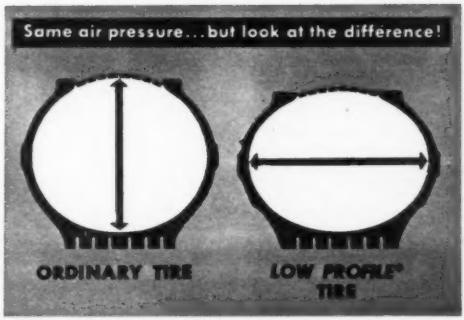
OW! THE TIRE THAT DOESN'T GET TIRED

Takes regular air pressure...*yet it's lower and wider to keep you safe at top speeds!*

a few quick knee bends—and what happens? heat up fast, soon feel real strain. Ordinary tires do 700 "knee bends" per mile they roll along under your car. This excessive ing builds up torturous heat, weakens rub- and fabric, increases blowout danger.

Now U. S. Royal reduces danger of tire fail- with a revolutionary new tire. Even though pressure is the same as in ordinary tires, S. Royal "Low Profile" tires are lower and der to flex less, run cooler, wear better.

"Low Profile" tires cost no more than ordi- ry tires. See the complete line now in 5 popu- price ranges for every make and model car t your U. S. Royal Dealer.



PS QUICKER, RIDES SMOOTHER. lower, wider shape gives U. S. Royal w Profile" tires more tread to grip highway. "Low Profile" tires are e of U. S. Royal's exclusive no- k rubber for the "Red Carpet Ride"!

STEERS BETTER, SAVES GAS. Pre-shaped to actual rolling proportions, U. S. Royal "Low Profile" tires are much more stable on curves, respond quicker in emergencies. And less flexing means 6 to 12 extra miles per tankful of gas!

ORDINARY TIRE SHAPE flexes excessively building up intense heat that murders tires, burns 'em out fast. But the **"LOW PROFILE" TIRE SHAPE** reduces flex, keeps temperature well below destructive danger zone. Running for hours on end at top highway speeds. U.S. Royal "Low Profile" tires stay cooler, keep you far safer.

PIONEERED BY U. S. RUBBER AS THE ANSWER TO GREATER TIRE SAFETY

U.S. ROYAL *LOW PROFILE** TIRES

United States Rubber
Rockefeller Center, New York 20, N. Y.

**"Low Profile" is U. S. Rubber Company's trademark for its lower, wider shape tire.*

NEW-BRIAR PIPE DISCOVERY

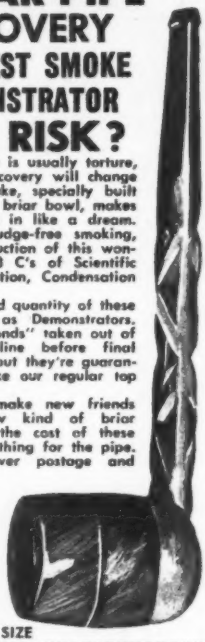
WILL YOU TEST SMOKE THIS DEMONSTRATOR AT OUR RISK?

Breaking in a new pipe is usually torture, but this "magic-cake" discovery will change all that. A nut sweet cake, specially built into the genuine imported briar bowl, makes this mellow beauty break in like a dream. You'll get dry, clean, sludge-free smoking, because the special construction of this wonderful pipe utilizes the 3 C's of Scientific Smoke Control — Combustion, Condensation and Capillary Attraction.

We've set aside a limited quantity of these imported briar beauties as Demonstrators. The bowls are "slight seconds" taken out of the regular production line before final smoothing and polishing, but they're guaranteed to smoke exactly like our regular top quality $2.95 model.

Because we want to make new friends for this sensational new kind of briar pipe, we've written off the cost of these Demonstrators. Send us nothing for the pipe. Please send 25¢ to cover postage and handling.

All we ask in return is your good-will and word of mouth advertising if you like the pipe. Remember, the risk is ours, you can't lose. Sorry, only 1 Demonstrator to a family on this non-profit transaction. (Good in the U. S. A. only.)



PIPE 2/3 ACTUAL SIZE

WALLY FRANK Ltd. Dept. J107
132 Church Street, New York 7, N. Y.
I enclose 25¢. Send me the Demonstrator Pipe described above. Please Print Name and Address Below.

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City ..... Zone ..... State .....

Mail For McCahill

[*Continued from page* 54]

old Motor's Auto Repair Manual that will give you all the dope on your '46 Ford.

● *Your comments on water mixed in with gas purchased at service stations made me wonder how many planes go down on take-off for reasons of water in the fuel?*

Paul Stadwick
Miami, Fla.

All the good pilots I know drain off a little gas before each flight to eliminate the possibility of water being in the line. On a recent trip in an old DC-3 the pilot made a point of draining gas off into a Coke bottle and then checking it for water before we took off. Of course, on the big commercial lines this work is *supposed* to be done by maintenance, but the job I was flying was privately-owned.

● *I haven't seen any of the readers call you a bum for a long time, and I miss it. So here goes: McCahill, you're a bum!*

Ken Schultz
Brooklyn, N. Y.

Good old Ken—a respecter of tradition!

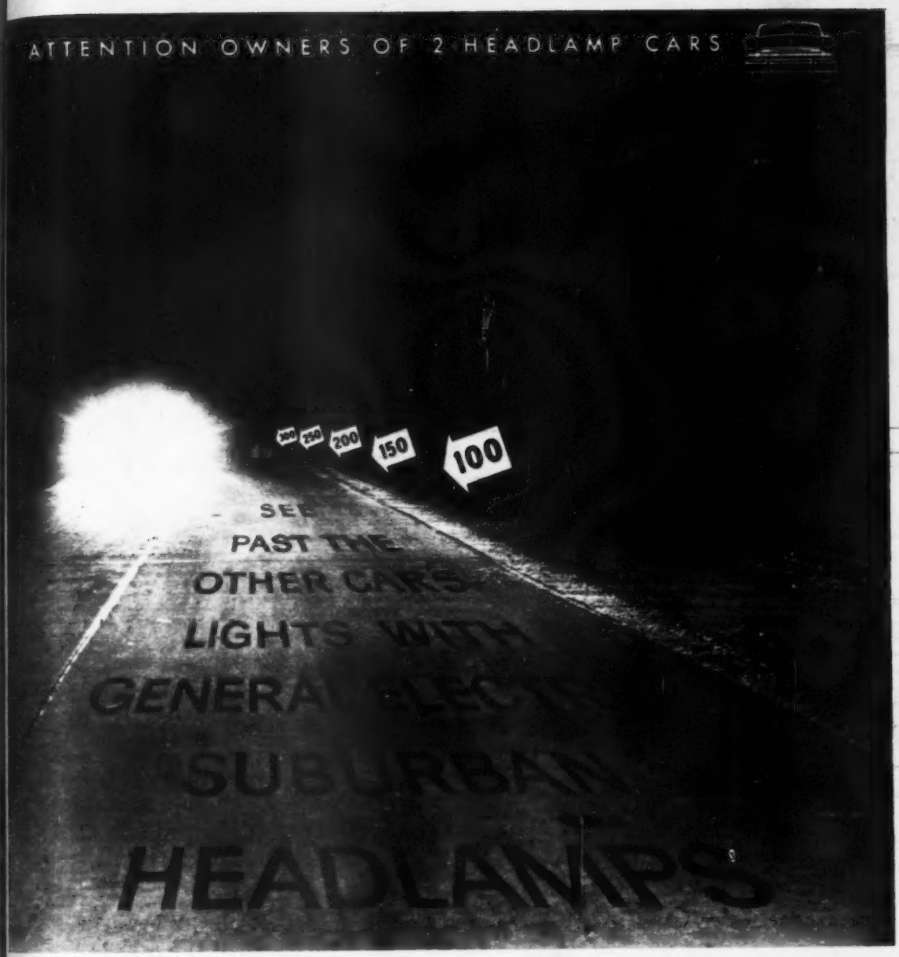
● *Your remarks on race drivers "living it up until the wee hours" the night before a big race prompts me to defend myself and other USAC drivers. If half our drivers were boozers and night-owls, as you insinuate, I'd agree it's a serious situation. On the contrary, however, USAC rules out this kind of conduct and our own common sense keeps us on a strict training program. In my own case, I usually take a workout in the YMCA whenever I can find one and have the time. In any case, I never touch hard liquor nor do I smoke, and I maintain a sensible early-to-bed schedule. Most of my racing associates are equally strict self-disciplinarians. By no means are we playboys, as you would lead your readers to believe, but are professionals in a field where our lives depend upon stamina and trigger-quick reactions. I don't know what automobile races you've attended, Tom, but catch one of our USAC events one of these days—and bring your "booze saliva-tester" if you care to.*

Rodger Ward
Winner, 1959 Indianapolis 500

Rodger, I'm only too happy to print that you are no boozer and train for events like a good prizefighter. However, this is not true of *all* your racing competitors.

—*Tom McCahill*

When answering advertisements please mention MECHANIX ILLUSTRATED



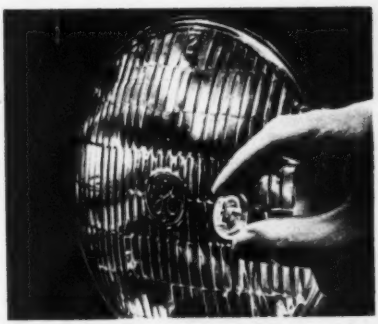
This picture was taken with new G-E SUBURBAN Headlamps *on the low beam*. See the hazard in the road beyond the lights of that oncoming car? With the low beam of ordinary headlamps, you'd be lucky if you saw it in time.

With new G-E SUBURBAN Headlamps you can see better in spite of the other car's lights—even when drivers fail to "dim" for you. Only General Electric puts the low beam filament *on-focus* to provide a "spotlight" effect that gives you *twice as much light as previous two-headlamp systems*—down the right side of the road where you need it.

Get a pair of G-E SUBURBAN Headlamps for *your* 2-headlamp car—and be sure you have them aimed properly. Enjoy safer night driving from now on! General Electric Co., Miniature Lamp Dept. M-05, Nela Park, Cleveland 12, Ohio.

Progress Is Our Most Important Product

GENERAL ELECTRIC



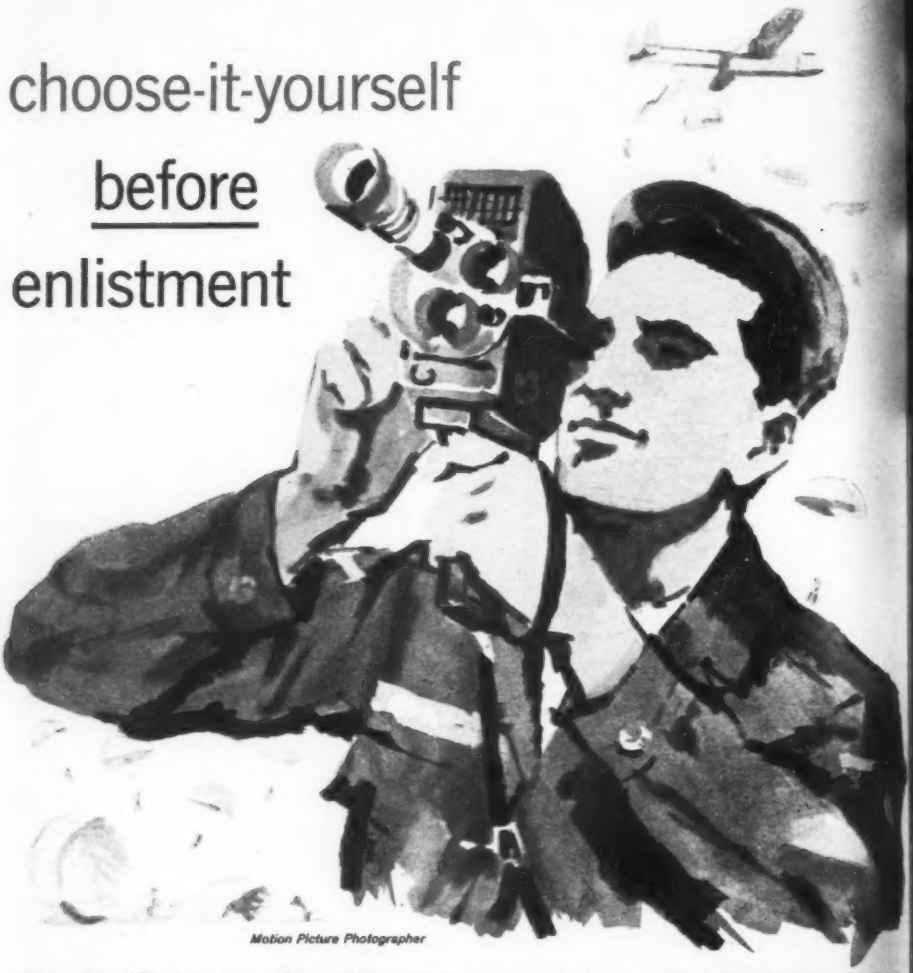
Have a pair of G-E SUBURBAN Headlamps installed and aimed today. Look for the big G-E monogram (bigger than a quarter).

want training in Photography? Mechanics? Electronics?

choose-it-yourself

before

enlistment

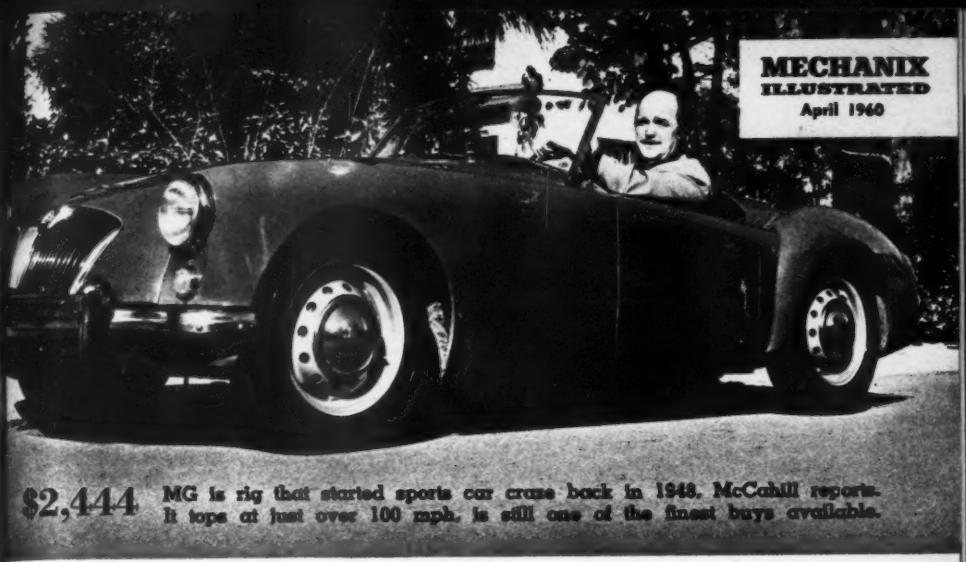


Motion Picture Photographer

It's up to you! The Army's new "Choose-it-Yourself" System lets you choose valuable training before you enlist. Here's how it works: 1. Choose before enlistment. Choose your training from fields like Photography, Missiles, Communications, Construction, Automotives—and many more. 2. Qualify before enlistment. Take aptitude and physical exams to qualify for the training you've chosen. 3. Know before enlistment. If you qualify, you know you'll get the training you want. Your choice is written into your future Army record—guaranteed before you enlist. Choose, qualify, know—this week! Ask your Army recruiter to show you his complete list of available training fields.

CHOOSE IT YOURSELF VOCATIONAL TRAINING SYSTEM

US ARMY



$2,444 MG is rig that started sports car craze back in 1948. McCahill reports. It tops at just over 100 mph. is still one of the finest buys available.

TOM McCAHILL REPORTS ON . . .

CARS BUILT FOR FUN!

These are cars for the connoisseur and are a ball to drive. Most of them have price tags under $3,000.

NOW that Detroit, with one or two exceptions, has made the American automobile as standard and utilitarian as inside plumbing (and just about as dull), what's left for *fun*?

Not so many years ago just about any automobile made could prove a swashbuckling adventure-companion in dozens of different

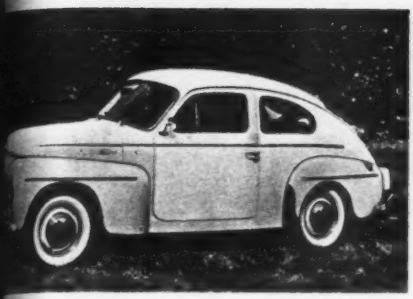
$2,675 Triumph TR-3. "Hottest of the whole under-$3,000 bunch," says Tom. It does just over 100 mph. knocks hell out of ten seconds for 0-60 mph.

$1,795 Austin-Healey Sprite is lowest-price job that qualifies as sports car. It tickles 80-mph on four-cylinder mill and has road feel of a Ferrari.

$2,768 Granturismo SAAB is hot, 100-mph model of standard two-cycle job, has new four-speed, all-synchromesh gears.

ways. All cars were fun to drive then. Even a trip to Florida could include as many true adventures as a picnic on the poop deck of a freshly-captured girls-for-the-colonies ship. Today, thousands of salesmen travel better than 50,000 miles a year without much more trouble than an occasional tire failure or other minor mishap. Coast-to-coast trips can be as unsurprising as warm weather in Panama. Driving has become—in the words of the Great Bard—"Strictly Drabsville."

But the guy who doesn't need a coop for his nine kids or a rear-seat lecture platform for his



$2,342 Volvo has close to 100-mph speed, is true connoisseur's car, has top workmanship, construction.

$2,685 Fiat 1200 Spider has four-cylinder mill, four-speed gearbox, posh appointments, swivel seats.

mother-in-law, there are still a lot of out-and-out fun cars being sold, many of them under the label "sports cars." Sports and fun cars don't have to be justified to anyone (as long as it's your loot you're spending), any more than a set of golf clubs, a shotgun or even a dog. They are cars those in the know will appreciate. As for those who don't—the hell with 'em.

A sports car is a lot more personal than just a piece of transportation, which it can also be used for. Any guy with a jigger of red blood can get a bang out of tooling one of these highly-co-ordinated small machines through country bends and around blind corners or just loping along a few inches above

$2,430 Karmann-Ghia seats two in comfort, has small rear seat. It does 90 mph, and gets better than 30 mpg. It is also tops from a quality standpoint.

$3,051 **Austin-Healey 3000 has six-cylinder mill, comes in two- or four-seat models, goes over 100 mph, has good acceleration, terrific road manners.**

the ground, enjoying the ride.

To start with, one of the biggest features of a sports car is its accuracy and fast response to your slightest prod. Many of today's sports cars can be creamed by a Michigan Mangler in a turnpike drag—but so what? The guy in the big Detroiter will never experience the man-and-car team feeling of the sports car owner. It's the difference between going out with your best girl alone or going out with her whole family. It is almost impossible to explain to a man who has never experienced it, the fun of tooling a sports car as against the boredom of pushing a family sedan. It's like trying to compare vintage wine with carrot juice.

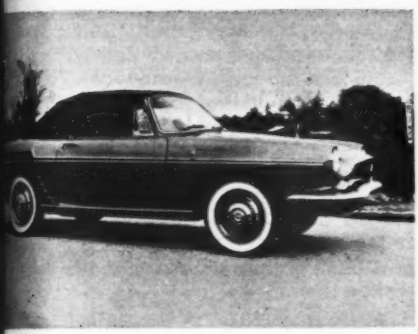
On the market today are a number of excellent sports cars selling for $3,000 and under that can be used in a variety of ways. You can race them, if that's your idea of jollies. You and a wife (preferably yours) can use them for rallies, or for just having a general all-around ball doing the things you can't do with the typical American Togetherness Bus. With a $3,000-and-under budget you can end up with a sports car capable of cracking 110 mph, or a little luxury bucket that'll draw crowds and mark you as your block's Man Of Distinction. You get that last title because you had guts enough to be different from the other 50,000,000 sheep roaming the highways.

Without wasting any more of your time trying to sell you on cars that are strictly fun to drive, let's look some of them over. The ones we are about to consider won't require a half interest in the Chase Manhattan Bank. It's possible, as you know, to pay more money for a sports car than for a house. These cars are not in that class but represent real buys that won't shame you or make you feel self-conscious in any company. You'll be able to stare down the doorman at "21" as you flip him a five spot and tell him to park it.

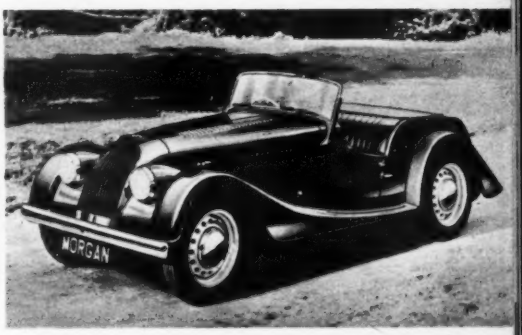
The Sunbeam Alpine is my choice as the most desirable offering in this crop, and the newest, but since it is covered thoroughly in my test on page 88 of this issue, we'll slide by it here.

The Austin-Healey 3000. When this car was introduced back in the early 1950s, it was as sensational as doubled money. Before many weeks the entire production was back-ordered by more than a year. Since its early introduction as a four-cylinder offering, the engine has been changed to a six, and the rear compartment has been carved out for two legless passengers, a couple of small kids or a big dog or two.

The Austin-Healey is one of the most desirable cars of semi-classic design



$2,395 Renault Caravelle is new arrival in U. S. It nudges 90 mph, gets 30-plus mpg, has top styling.



$2,810 Morgan Plus Four boasts classic looks, 100-mph performance, superb road handling qualities.

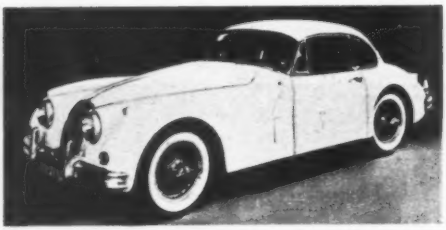
$1,795 Berkeley has two-cylinder air-cooled engine, fiber glass body, does about 75 mph, gets 40 mpg.

$3,219 Simca Oceane is a four-cylinder, 53-hp rig. Two-passenger car gets 40 mpg and does 90 mph.

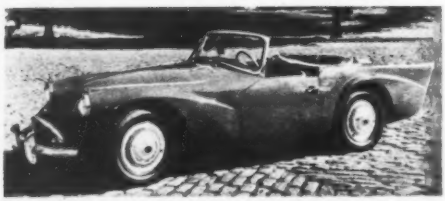
LUXURY BARGES for guys with extra dough. The quality Mercedes-Benz 190SL is a $5,032 rig.

LANCIA APPIA convertible has a four-cylinder engine and 90-mph top speed. Price: $4,490.

PORSCHE SUPER has four-cylinder, air-cooled mill. 110-mph speed, gets 28 mpg, is $3,910.



JAGUAR XK150 does 130-plus mph, gets 20 mpg on six-cylinder, 225-hp mill. Price: $4,250.



DAIMLER SP 250 sports V8 engine, 140 hp, does over 120 mph and gets 25 mpg. $3,923.

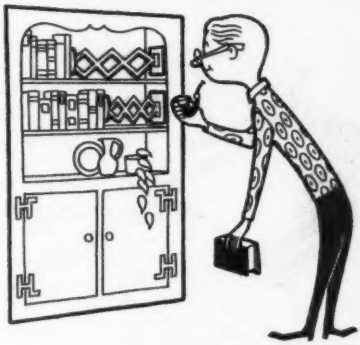
ever to hit these shores. For a price tag of about $3,000, plus a bob or two when loaded with extras, this car is a great buy, if your competition desires don't stray much beyond a Class Production race or a hot rally. It's available in either two- or four-seat models with over 100-mph performance, good acceleration and terrific road manners. As a small family car (meaning two, plus junior offspring) it's as reliable as a Civil War lecture in Atlanta. Service is adequate and nationwide.

The MG-A 1600. The MG is the car that started all this sports car ruckus in America when the old TCs started showing up on our roads about 1948. The TC was the first out-and-out sports car ever tested on these pages. Progressively, the MG has not kept up with the competition as well as it should have, in my opinion. It held onto its 1¼-liter engine much too long and when it went to a full 1½-liters with the now-old TF, it still wasn't the ball of fire you'd expect from a car that led all imports by many miles just a decade ago. It had the world by the tail but somewhere along the line the MG management loosened its grip.

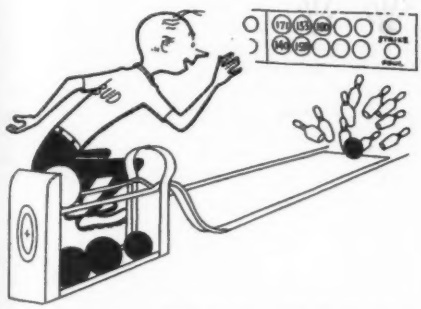
Today the MG-A, every inch a sports car (selling for $2,444) is still one of the finest buys on earth, though it has less prestige than it once had. No car selling for under $5,000 is better built and its reliability is unquestioned. It's a great little fun-sports car with a top speed of just over 100 mph and a fair head of acceleration performance that'll allow it to get up to 60 mph in about 13 seconds. It's a great car for rallies and similar sports but as a competition rig it can't do much except against other MGs. It is comfortable and if you have lots of loot you can order a Twin Cam version selling for quite a bit over $3,000, with a top speed of better than 110 mph. However, at this price it runs into a bargeload of competition and hasn't proven too successful on the big sports car circuits. The MG is one of the greatest and worth every dime it costs, if it fits your needs.

The Triumph TR3. When the Triumph was first introduced to these shores a few years ago it was a toothless, flat-sided bucket with a heart of pure gold, some pretty nice upholstery and a fair turn of performance. That was the TR1. The [*Continued on page* 180]

SLOSH BROOM that applies water as you sweep pavement, combining hose and broom in one. Paul Dunchach, Spangler, Pa.



PUSH-A-BOOK device for frequently-used book shelves, to keep books upright and in shape. Danny MacLaurin, Hanover, Md.



ALLEY SCOREBOARD that would show running totals as well as strikes and fouls. Mike Rosenbleeth, North Miami Beach, Fla.

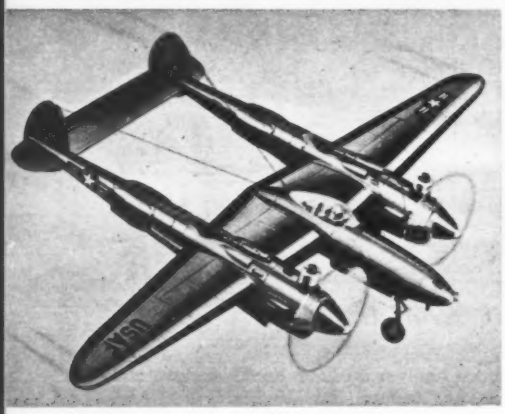
INVENTIONS WANTED!

Is there a gadget you think should be invented? If so, send its description to Inventions Wanted Editor, MECHANIX ILLUSTRATED, 67 West 44 St., N.Y. 36, N.Y. Each one printed will be awarded $5.

FIREPROOF SLEEPING BAG that would allow campers to go to sleep close to the campfire. John Emery, Fort Collins, Col.

TAILGATE COOKER as part of the built-in equipment of the fishing and camping station wagon. Jack Boehner, Trenton, Mo.

Now See This!



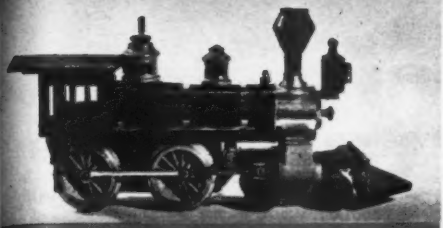
LOCKHEED LIGHTNING P-38 plastic scale model is the first twin-engine, ready-to-fly craft in its field, according to its maker, Wen-Mac Corp., Los Angeles, Calif. It is a model of the famous World War II fighter plane. The craft sports twin tails and twin booms. It has a 21.5-inch wingspan and is more than 17 inches long. Two .049 engines with three-bladed props supply power. The retail price of the tether-controlled model is $16.98.

Z-BOAT made of expanded polystyrene can tote 250 pounds yet weighs only 15 pounds. It can't sink and is untippable because of outrigger attachment. The all-purpose boat is fine for children and can be paddled by hand. It is five feet long, has a 29-inch beam and three-inch keel. It comes in blue and yellow, olive drab, red and white, blue and white and all red. Jay V. Zimmerman Co., St. Louis 17, Mo. $55, including outrigger.

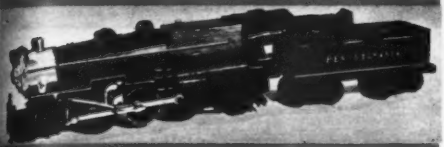
Photo courtesy Ford Motor Co.

TOYOTA LAND CRUISER is a rugged, four-wheel drive utility vehicle that is powered by a six-cylinder, 135-hp engine. It boasts a four-speed transmission, gets about 20 miles per gallon and tops out at around 80 mph. The Japanese rig has an 89-inch wheelbase, a 151-inch length and is 65 inches wide and 72 inches high. Weight is 3,197 pounds. Steel top model: $3,365. There is also a canvas top job available: $2,930.

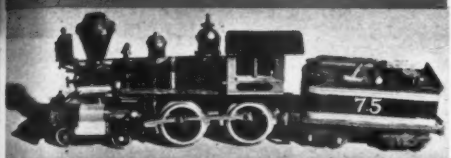
CHOW HOUNDS will wag their tails for joy at the master who brings home this automatic pet feeder. When dog's best friend goes out, Fido will no longer growl with his hunger pains. Master need only fill the scratch-proof, rust-resistant tray and set the clock. The tray automatically moves into feeding position at the pre-set time, has hammertone gray baked enamel finish. $9.95. H.S.M. Co., 253 10th Ave., N. Y. C.



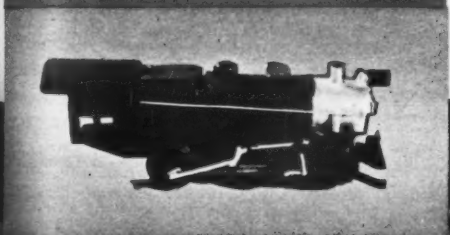
THE GENERAL—a Civil War iron horse.



PENNSY LOCOMOTIVE with coal tender.



ANOTHER MODEL of the famous General.



SWITCHER made of humble can metal.

TIN-CAN CHOO-CHOOS

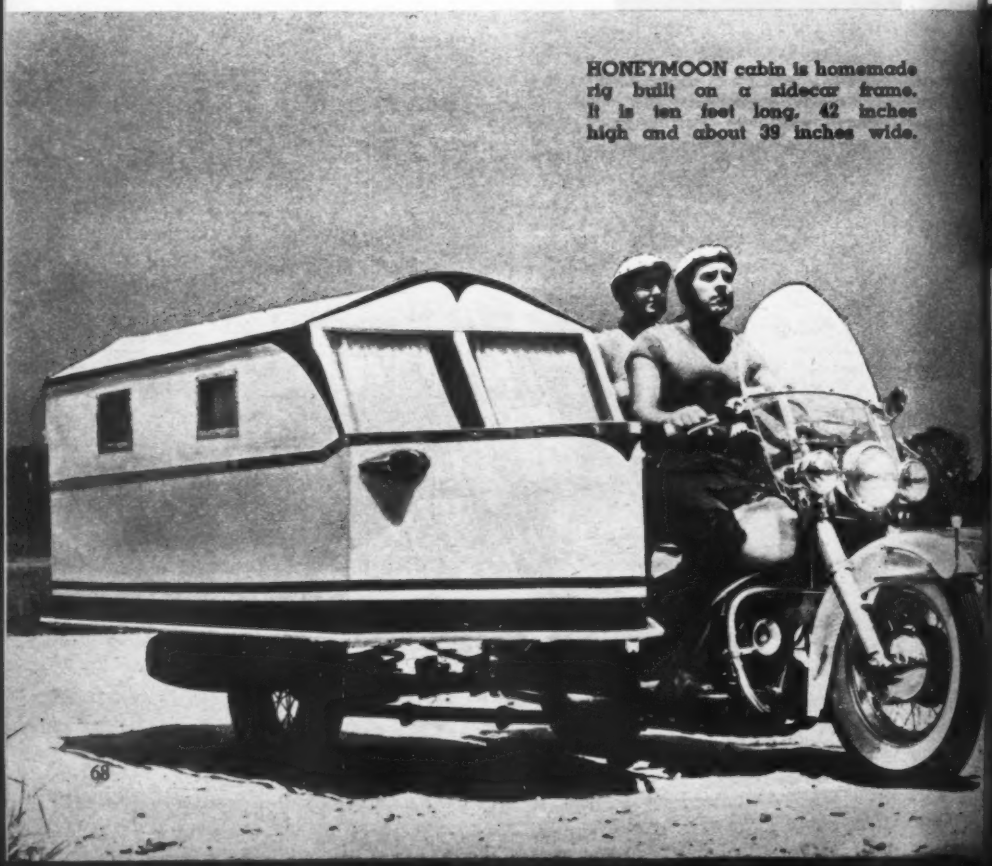
MANY interesting things happen to old tin cans, but few of them come to such an artistic end as those salvaged from the kitchen waste by Donald Smith of Coraopolis, Pa., an ex-Pennsy roundhouse foreman who converts ex-tomato soup cans into model locomotives. A book about 100 Useful Things You Can Make Of Old Cans could not include Smith's models, which are things of beauty rather than utility and which you couldn't make anyway—unless you're highly skilled with the tin shears or likely to become so. But this is one hobby that's all fun and no outlay. •

SNIPPER SMITH at play. Ex-railroader is now employed in advertising.

MOTORCYCLE SIDECAR SLEEPS 2

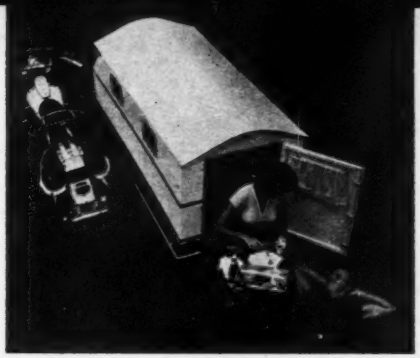
NEWLYWEDS Poin Dexter Galloway and his lovely bride, Devona, began a unique honeymoon trip after their wedding last summer. They left Louisville, Ky. in a homemade motorcycle sidecar that sleeps two. Destination was Florida, then a flight to the Bahamas for a more conventional honeymoon.

Galloway, a motorcycle enthusiast, built the ten-foot cottage on a sidecar frame. The rig is 42 inches high and about 39 inches wide. It includes an icebox, stove and battery-powered lights. The sidecar is made of plywood, has seven windows and is painted with white boat paint. •



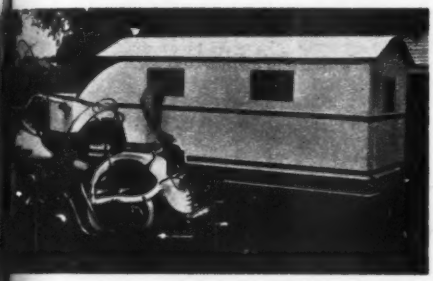
HONEYMOON cabin is homemade rig built on a sidecar frame. It is ten feet long, 42 inches high and about 39 inches wide.

PLYWOOD-MADE sidecar took about six months to build, is painted with boat paint.

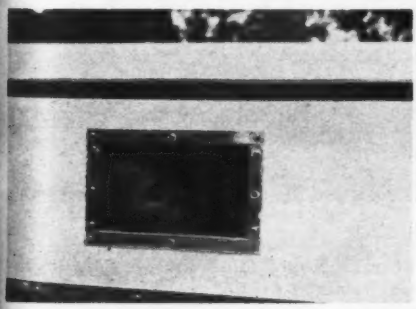


SIESTA. Sidecar was equipped with small icebox, stove and battery-powered lights.

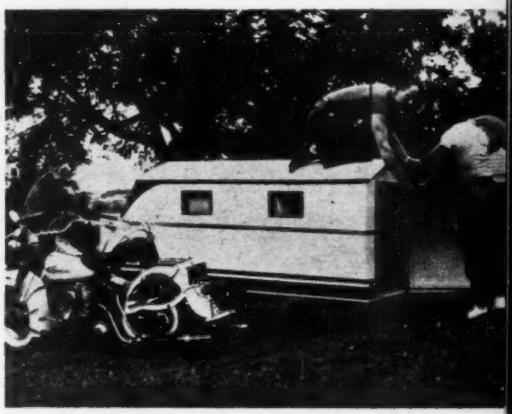
HOME away from home sleeps two comfortably, is equipped for light housekeeping.



GROOM reaches for one of his saddlebags. He is member of Louisville Motorcycle Club.



KISSING couple. The window is one of seven groom built into mobile honeymoon cottage.



AIR MATTRESS added to interior comfort. Newlyweds flew to Bahamas from Florida.

How To Dress For Spring Fishing

WARM AND DRY are the watchwords. Expect good fishing and cold, nasty weather and you will outdo the crowds of shivery city hicks.

By Wynn Davis

MANY a man has come back from an early spring fishing trip with an empty creel and a cold in the head, or a broken leg, or worse, because he didn't wear clothes to match the weather conditions. Proper clothes are every bit as important as proper tackle. This is true whether your trip is for a week or an afternoon.

Just last [*Continued on page* 185]

IT'S NEW!

PININ FARINA'S experimental Cadillac has transparent plastic roof. It can be covered with electrically operated aluminum panels that slide into rear deck at touch of button.

HIDEAWAY bathtub, German, folds up into wall, can be lowered in jiffy. When up, it hides hot water heater and tank.

ELECTRONIC bike, owned by English schoolboy Howard Coleman, has 12 lights, radio, speedometer, horn, burglar alarm.

CONTINUED...

GYROPLANE is Canadian Avian 2/180. It seats two, has four-cylinder Lycoming engine, cruises at 150 mph. This vertical-takeoff job will sell for about $10,000.

NEW CART for supermarkets is designed to prevent cartnapping. Magnets buried in ground around market lock the cart wheels. Swiped carts cost market owners millions.

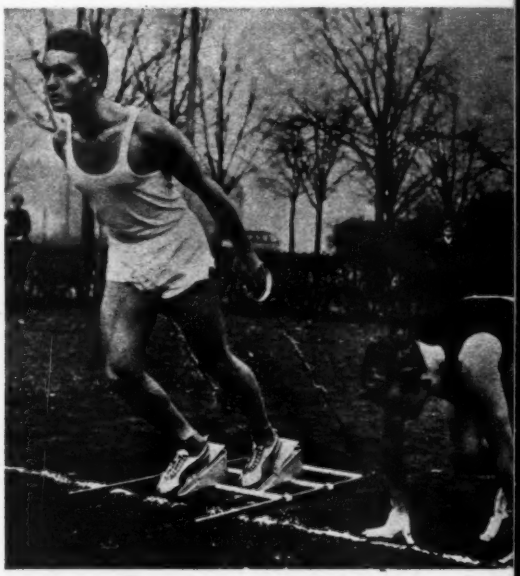
ARMORED BOOTS now under test by Marine Corps, allow men to walk on anti-personnel mines.

VENDING MACHINE sells five different items, takes coins or bills and makes proper change. It automatically totals money received and rejects bogus currency. Experimental "automatic merchandiser" is from National Rejectors, Inc.

PORTABLE tank of oxygen with a plastic mask is designed to be carried in police cars, used in case of auto accidents or heart attacks. Made by Linde Co., Canada.

AIR-FILLED boxing gloves are invention of Finnish doctor. Air is blown through small valves into inside pockets. Gloves are said to prevent bloody facial cuts.

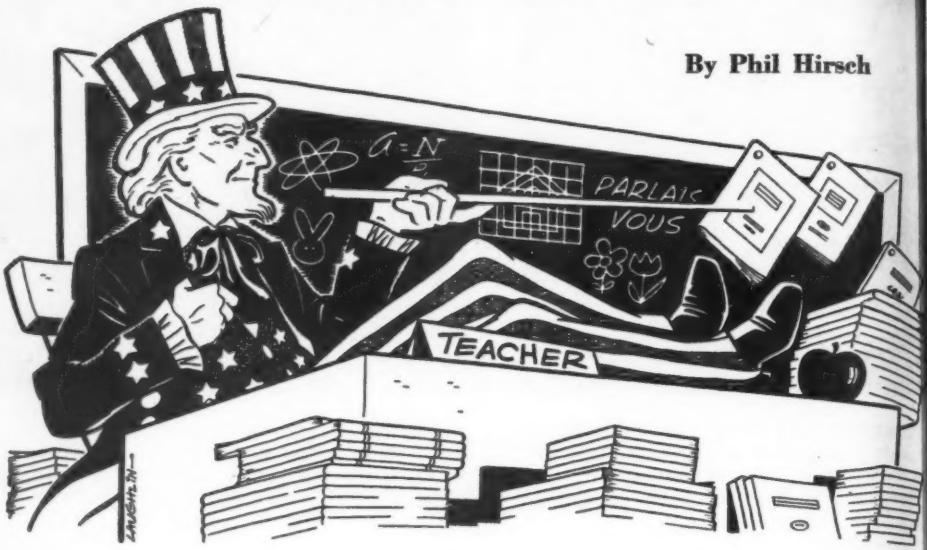
ANSWER to problem of sidewalk grilles and women's high-heeled shoes are these plates for comfortable strolling. They've been installed on Kiel, Germany, grilles.



NEW STARTING device, left, lets sprinter lean over starting line although feet are "legally" behind line. He drops handles, springs away at gun. Inventor is German.

YOU CAN LEARN IT FROM

By Phil Hirsch



THE number of Americans troubled by bedbugs probably is not large. But Uncle Sam—always alert to the taxpayers' slightest needs—has some sound advice on chinches in a booklet entitled How To Control Bedbugs, which explores just about every phase of the subject.

The next time you have to bail out over shark-infested waters you won't want to be without another government publication, entitled Shark Sense, that describes, with text and illustrations, how to convince the shark that you're not his meat.

These publications may not kindle your immediate interest but they do indicate the almost limitless variety of booklets and brochures published by the U. S. Government. Uncle Sam can supply you with instructions on cooking scallops, pouring concrete, getting along with the natives of southern Europe, and an explanation of missiles, rocketry, satellites and space science. His vast library also includes a Manual Of Septic Tank Practice, plus pamphlets with such awesome titles as Photoelectric Tristimulus Colorimetry With Three Filters.

But besides such highly-specialized publications, the government puts out hundreds of booklets crammed with valuable information for the home owner and hobbyist.

Wood-Frame House Construction is a typical title. This booklet tells you how to pour concrete floor slabs, erect and finish interior partitions, install insulation, hang doors, build stairs, driveways, walks, chimneys and fireplaces, lay linoleum and other floor coverings and complete many other construction jobs in and around the house. All for 65 cents.

Another booklet, entitled Starting And Managing A Small Business Of Your Own, costs only 40 cents, covers how much capital you need to set up in some 50 different kinds of enterprise, where to get the money, the advantages of buying a going business, how to buy, price and sell merchandise, business

UNCLE SAM

taxes and insurance.

The Superintendent of Documents, from whom you order these booklets, probably sells more pamphlets than any other individual on earth. Currently, his mailing list totals about 675,000 names. You can get on it simply by making a written request (see below).

Headquarters of this booklet club is the Government Printing Office, an agency bearing roughly the same relationship to the rest of the government that a publisher does to an author. In the course of administering the laws, and carrying out their multitudinous research activities, federal departments and agencies unearth vast amounts of information useful to the general public. Sometimes the agency or department prints and distributes the material itself. But usually the project is handed over to GPO officials.

The Superintendent of Documents takes care of the distribution job. Currently, he has about 30,000 titles for sale; they can be purchased either by mail or at a bookstore located in the GPO building. Each year, 4,000 to 5,000 new titles come out.

To become a member of the Superintendent's booklet club, all you have to do is write him a note saying that you'd like to receive the Selected U. S. Government Publications price list regularly. The address is: Superintendent of Documents, Government Printing Office, Washington 25, D. C.

The selected list comes out every two weeks and catalogues all new publications which the Superintendent has available for sale. Periodically, flyers are prepared from these lists and are sent to everyone whose name is on file. Each flyer contains a [*Continued on page* 190]

FULL-WIDTH machine weighs two lbs., has a telescopic carriage. Machine is British-made.

POCKET-SIZE TYPEWRITER

OPERATION is standard. "Pocket" in this instance means a sportswriter's game pocket.

FOUR-COLOR RUBBER STAMP

ROLLER, REALLY. Rolling eliminates banging, smudge, wrist fatigue. When putting information on back of a photo it does not harm the picture. Inside the plastic cover are a number of inkpads, allowing the use of several colors at one "stamping." Made in Germany.

BRIGHT IDEA AWARD MECHANIX ILLUSTRATED

Kut-All

CUTTING FACE is 1½ ins. long, needs no sharpening, cleans itself as it works.

PORTABLE ELECTRIC DRILL gets another job. Combo makes edge-shaping fast and easy.

YOUR portable electric drill can now have another wonder-working attachment. The Kut-All, a multi-purpose tool for wood, plastics, metal and almost anything except diamonds, is all hardened steel. It needs no cleaning or sharpening. Great for shaping contours and edges, rasping, planing, smooth-finishing, beveling, cross-grain finishing, taking off paint, deburring metals and castings. $2.50, Copley Sales Corp., 721 Carroll Place, Teaneck, N. J. •

WIN $50

MI will award $50 each month to the first person who tells us of a new and useful gadget that is patented and in production. Manufacturers are also eligible for this award. Pictures and a description should be sent to Bright Ideas Editor, Mechanix Illustrated, 67 West 44th Street, New York 36, N. Y.

PARKING-LOT SAILORS

STARTING A RACE: helpers hold the craft back as the wind fills sheets and bedspreads.

JOHN and Robert Bowater and Mark Jacobson, junior citizens of Lynwood, Calif., have a new use for old skates, old sheets and bedspreads, an empty parking lot and a spanking breeze. Working without plans or instruction in the art of sailing, the boys discovered the joys, pains and principles of sail all on their own. Besides the square rigs shown here, they are working on more ambitious fore-and-aft-rigs. •

MAJESTIC spread of chenille takes the mild wind.

SQUARE RIGGER: crew can't swarm the shrouds—

so this is how he shifts his upper main topsail, up-ending his yacht.

I RODE AN

By
J. Robert
Connor

USS SEAWOLF churns up the sea as she travels at speed during one of her rare moments on the surface. Crew works on deck (above) and one of the atom-powered sub's two periscopes is shown at the left.

TORPEDO ROOM. Lt. Terrass told me that tin fish are always ready to fire at sea.

A BRIGHT sun hit the grey-black deck as photographer Curt Gunther and I crossed the gangplank and stepped aboard the *USS Seawolf*, America's second nuclear-powered submarine, at Groton, Conn.

Busy crewmen wearing yellow life jackets prepared to get the boat underway. They hauled in the wrist-thick mooring lines and deftly coiled them in their assigned bins under the deck-plates.

At 0800 Captain Richard Boyer Laning, then skipper of the *Seawolf* (he is now with the office of Chief of Naval Operations in Washington, D. C.; the new skipper is Lieutenant Commander Alfred J. Whittle, Jr.), gave the signal to start the engines from the bridge halfway up the 54-foot-high conning tower. The atomic-powered steam turbines turned over with a muffled roar, then settled down to a steady, quiet beat. The

ATOM SUB

Seawolf slowly backed out of her berth, turned around, and headed out to sea.

The *Seawolf* rides low in the water. There are no handrails, except around the conning tower, and waves sweep the deck in rough weather. Gunnery Officer Lieutenant Milford Terrass told us of standing watch hip-deep in water with waves cascading over his head in the bubble-protected part of the conning tower.

Four hatches dot the deck of the boat, one located in the conning tower. We climbed down the hatch that passes through the officers' wardroom on our way to the crew's mess, one level below.

The crew's mess is huge by submarine standards. It is 20 feet long by 30 feet wide. It seats 42 men and when movies are shown an extra bench-type seat can be pulled out from under each table. This is the recreation center for the crew and also an emergency operating room with two large surgical lights placed strategically overhead.

Captain Laning, a 1940 Naval Academy graduate and veteran of World War II, briefed us here and gave us the run of the boat. We were then issued a dosimeter and film badge. The dosimeter lets you make a quick visual check for radiation in milliroentgens while the film badge, pinned to your coat, gives a more accurate and permanent record. The *Seawolf* has a closet-size nucleonics laboratory where the crew's film badges are checked regularly, along with the drinking water.

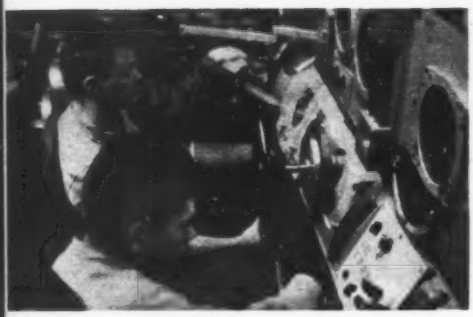
Suddenly a frog-throated klaxon horn burped twice and the calm voice of the Diving Officer ordered "Dive, dive."

The heavy clang of hatches being shut followed by the noise of surging water in the ballast tanks is an ominous sound to unaccustomed ears. Going down, the

CREW'S MESS seats 42 men, is movie room and much larger than old sub's.

100-RECORD juke box plays at push of button, says commissary man Bill Crow.

ENGINEMAN Carl Gay notes gauges and lights that tell how plant is running.



THREE MEN in attack center keep sub on even keel and guide its direction.

deck tilts gently under your feet but soon levels off as the *Seawolf* reaches her appointed depth. There is no sensation of movement below except when the boat moves up or down or makes a fast turn. There are subway-type straps hanging from the bulkheads which can be grabbed in case of a sudden dive or roll. On routine operations you might as well be sitting in your living room. When you go up, there is a tremendous whoosh as the big boat breaks the surface of the water.

In one corner of the crew's mess a juke box hangs on the bulkhead.

"How many records does it play?" I asked Leading Commissary Man Bill Crow of Iowa.

"One hundred," he said, "and we don't have to put in any nickels. You just make your selection, push the button and it plays."

In another corner of the mess is the only electronic organ in the fleet. Machinist David Cornell of Scituate, Mass., is the sole man aboard who can play it. The crew's mess also contains a tape recorder, a TV set (it can be used only in port), a good-size library and numerous magazines.

Chow served here is cooked on electric ranges in the compact kitchen on the forward side of the crew's mess. It boasts a garbage disposal unit that rids the boat of waste via tube. All dishes, cups and plates nest in special racks so that in a fast turn everything won't [*Continued on page* 189]

ATOMIC sailors eat high on the hog. David Cornell assists in mess, left, plays organ, right.

THE MAN WITH 125 PIPES

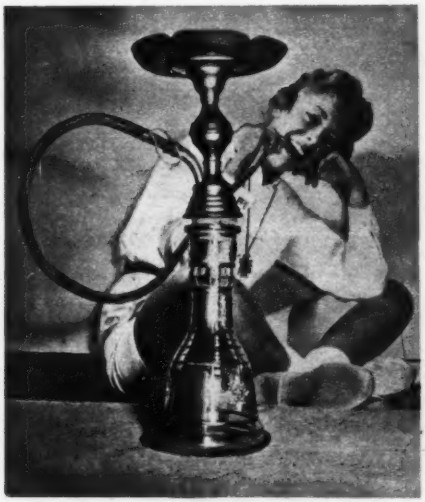
ALL THOSE PIPES and no tobacco; he only collects.

TEXAN pipe is in Bronx man's collection.

NEITHER Max Kaplan (above) nor his daughter Adelaide (below) is a pipe smoker. But Max collects pipes with the best of them without involving himself in the sordid details of dottle, goo, reamers, cleaners, burnt tongue and gifts of scented tobacco. Pipes come from 19 countries. In Turkish pipe Adelaide toys with, the smoke *would* pass through the water in bubbles. •

AUSSIE bushman paddles keg-laden canoe.

SHAKESPEARE head adorns this short clay.



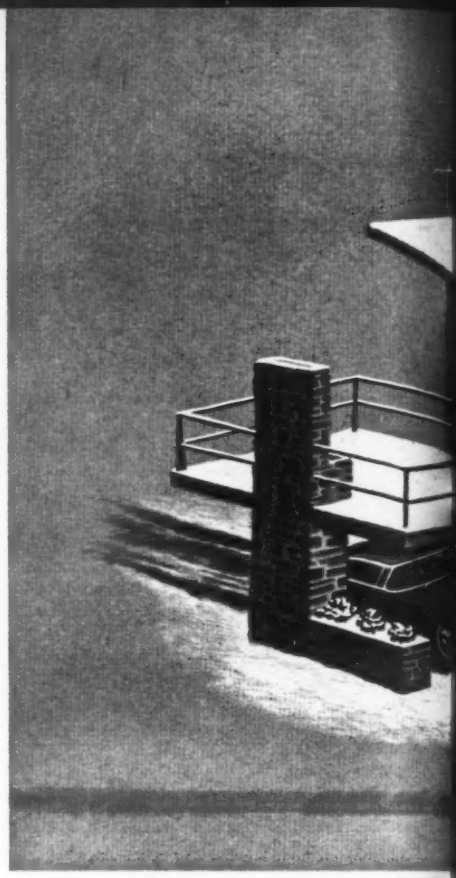
HUBBLE-BUBBLE—and also hubba-hubba!

IMAGINATION HOUSE is a startling and futuristic dwelling with walls of air which MI has adapted from a design by A. William Hajjar, an architect who practices his own specialty while serving as professor of architecture and senior design critic at Pennsylvania State University at University Park, Pa.

Hajjar's revolutionary new concept is being tested in a recently completed four-story 26x26-foot building at Penn State. The research is being done under a grant from the Pittsburgh Plate Glass Co.

The unorthodox building has a skin of glass around its entire outer surface, with a space of two or three feet between the skin and the inner wall.

Between these two walls Hajjar hung an unusual plastic curtain which has an electric circuit printed into its fabric. This curtain will heat the building when the sun is not warm enough. The glass envelope, or air space, will enable the circulating air to be drawn in at corner vents to function as a built-in climate controller, moving



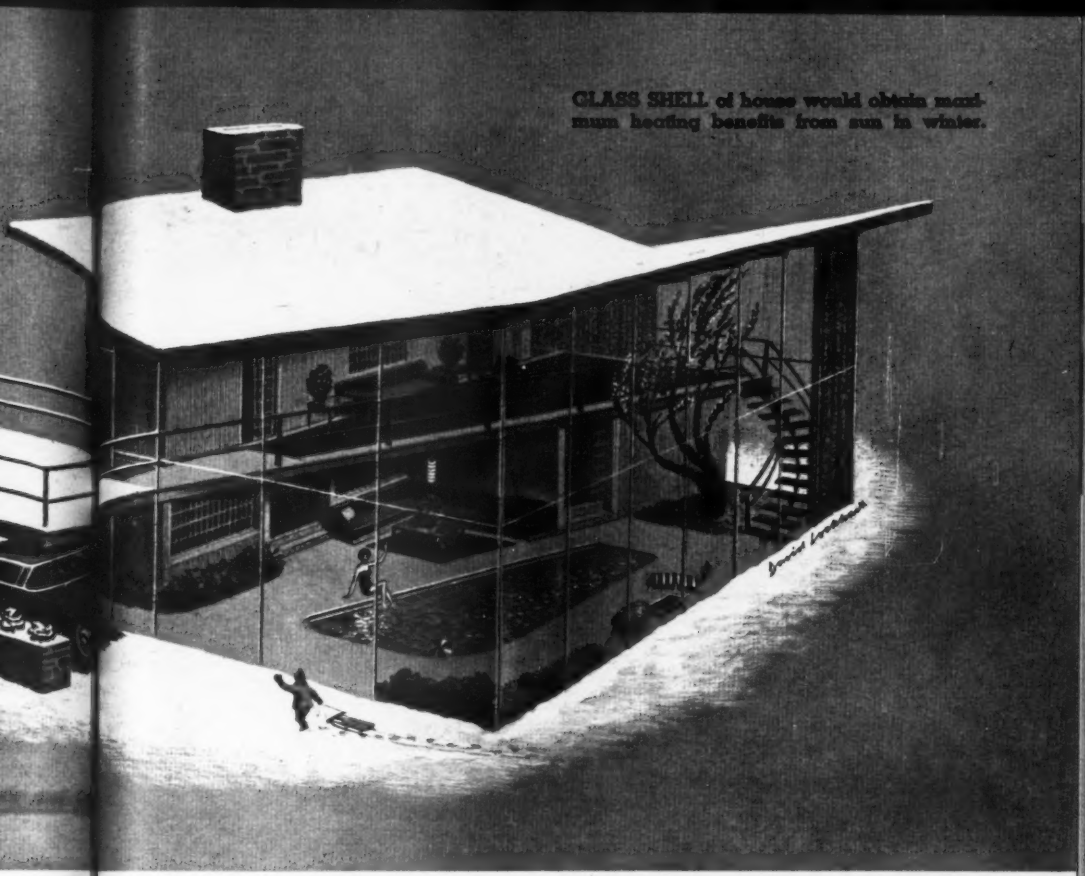
HOUSE WITH WALLS

sun-warmed air via fans to the cool side of the building and cool air to the sunny sides, when necessary. This warm air will also be stored and used on days when the sun doesn't shine. The air space can be illuminated at night to provide "daylight."

While Professor Hajjar's initial design is for an office building, MI artist David Lockhart has used the principles involved to plan the advanced design home illustrated above.

MI's design uses the inner wall of the house as the second wall utilized in Hajjar's office building. Actually, the MI plan depicts a "house within a house." The outer shell consists of glass to obtain maximum heating benefit from the sun during winter months.

In the winter illustration, above, the electric curtain has been left open to show an inside view of the patio and pool area. The curtain would be closed during cold spells to furnish heat—which means that the occupants of the house would be able to go swimming year-round. This amazing electric curtain would also work with the sun in winter, providing less heat on days when the sun's rays were strong enough to contribute warmth. In summer, occu-



GLASS SHELL of house would obtain maximum heating benefits from sun in winter.

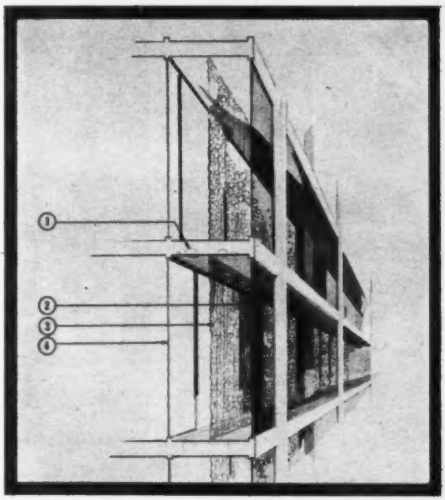
LS OF AIR

pants would switch to the cool air system. Here air is drawn in through vents and cooled and circulated by fans.

Hajjar's novel construction and his use of an air wall eliminates ducts and shades. The air-wall construction, according to the architect, "would do away with the problem of waterproofing, painting and maintenance in general. Your maintenance would simply amount to washing off the surface."

Hajjar also believes that his air-wall edifice might be the ultimate answer to making solar heat practical.

This is truly a home of the future, one that you and your family may be enjoying before 1999.—*J.R.C.*



AIR-WALL house principle: 1. lighting; 2. glass wall; 3. heat curtain; 4. inner wall.

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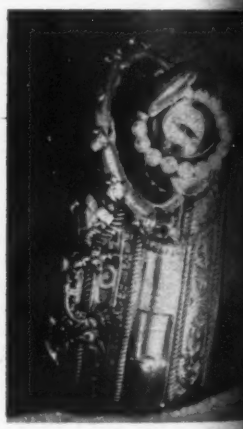
WORLD'S MOST COMPLICATED WATCH

THIS ornate gold-case French pocket watch is decorated with allegorical figures and Zodiac signs and tells seconds, minutes, hours, days, dates, months, seasons, years, sunrises, sunsets, solstices, phases of the moon, compass bearings, positions of stars, temperature, barometric pressure, altitude, humidity —and rings the hour! •

FRONT FACE has a visored, pearl-studded winding crown. Watch was started in 1897, took seven years to finish.

BACK FACE of watch. When completed in 1904, value was about $5,000.

TIMEPIECE is contained in spherical ornamental case. Grandaddy pocket watch is in Besancon museum.



WINDING CROWN is on hinge which opens to reveal the compass.

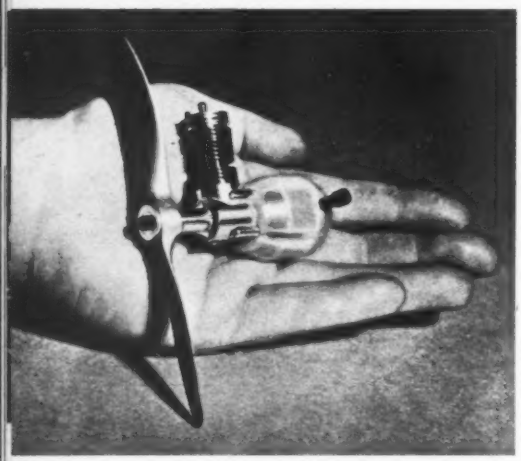
MIMI
MIMI's cleaning up this month. She's using her brand-new electric floor washer made by the Hoover Co., Canton, Ohio. The nifty 11.5-pound device puts clean water on the floor, then scrubs and vacuums it dry. You don't wet your hands. $79.95.

THIS PLANE CAN TAKE IT

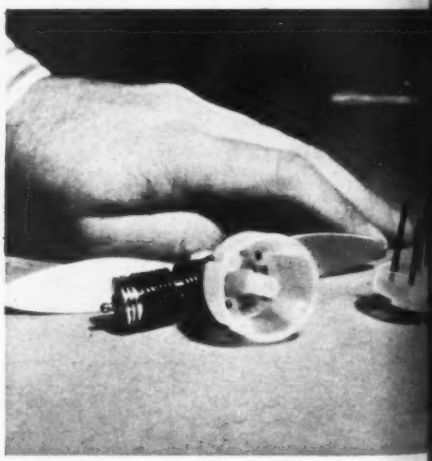
RUGGEDNESS of plastic craft is shown by flying it into side of hill at full speed.

THIS model plane really can take it. It is made of high-impact, shock-resistant polystyrene and you can send it zooming into the side of a hill and all it does is bounce up, ready to fly again. The built-to-scale L19 Bird Dog model is 13 inches long and sports a wingspan of 17 inches.

Another advantage of this model that comes ready to fly is that its little power plant, which utilizes a new type of instant carburetion, turns over at the flick



ENGINE is .049 Tornado, puts out 14,000 rpm and gives craft speed up to 75 mph.



SECRET of easy-to-start engine is a new and a more efficient venturi carburetor.

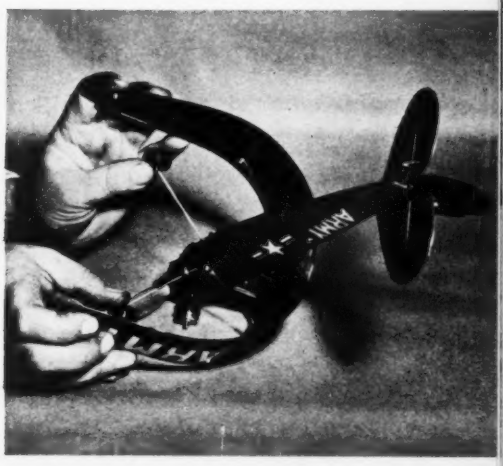
ENGINE turns over at the flick of a prop. Four of them were started in fast order.

BIRD DOG is made of durable plastic, has wingspan of 17 inches, is 13 inches long.

of a prop. The engine also has a visible fuel level and operates on regular model engine fuel.

Aurora Plastics Corp., West Hempstead, N. Y., makes the Bird Dog which retails for $9.95. The firm also produces flying models of the P-47 Thunderbolt and twin engine B-25 Mitchell Bomber, in addition to 400 varieties of scale shelf models. •

NOVEL tail has flexible plastic hinge. It snaps into stabilizer and elevator sections.



FLEXIBILITY of the durable built-to-scale model is shown in wing bending exercise.

McCAHILL TESTS

THE SUNBEAM ALPINE

"SUNBEAM ALPINE gives the buyer top looks," says Tom, above. The removable hardtop, left, can be had as an optional accessory in addition to the soft top. Photo below shows hardtop roof in place.

Uncle Tom calls this new 100-mph sports car "A real dream bucket, one that seems to have everything at the right price."

By Tom McCahill

SPORTY two-passenger rig boasts clean-cut lines, fins and a wheelbase of 86 inches.

SINCE my hair crop first struck a drought many years ago, literally hundreds of new sports cars have been introduced. Very few have been exceptional. To be an outstanding sports car doesn't necessarily mean it has to be fastest in its class or even the best-looking. Character and personality are as much a part of a sports car's makeup as guts and performance. In recent years such cars as the MG, XK120 Jag, Porsche and Austin-Healey have all been noteworthy for looks, character or performance. At the time these cars were brought out, there were many other sports cars that never caught on in quite the same way.

We wrote on these pages long ago that, among other things, a successful sports car had to be something that touched the imagination or sparked a dream. Unlike Detroit stampings, all pretty much alike, the sports car was accepted as a piece of sporting and fun equipment, with functional properties tossed in for good measure. The guy who bought a sports car because it would save him money on gas in getting to the button factory, or because it was easier to park, never should have bought one in the first place. Sports cars are dream stuff.

A real dream bucket, one that seems to have everything at a right price, comes along only once in a long while. The new British Sunbeam Alpine is definitely one of the few. If I'm any judge of such things, the Alpine should prove as popular as a gift certificate to Tiffany's and it ought to stay with us as an outstanding buy for some time to come.

With a price tag of $2,599 the new Alpine gives the buyer top looks, a lot of functional features and real crisp 1½-liter performance. For an extra charge a removable hardtop is available in addition to the soft top. The car also features wind-up windows, something you rarely find in a high-performance bucket

TEST CAR SPECS

MODEL TESTED: **Sunbeam Alpine**

ENGINE: **4** cyls; **91.2** cubic ins; **93.5** brake hp; **89.5** ft-lbs max torque; **8.2** to **1** compression ratio. Bore **3.11** ins; stroke **3** ins. Fuel required: Regular. Standard axle ratio: **3.9**. Wheelbase **86** ins; length **155.25** ins; height **51.5** ins; width **60.5** ins; front tread **51** ins; rear tread **48.5** ins. Weight **2,185** lbs. Gas tank capacity **10.8** gals. Turning circle diameter **34** ft. Tire size **5.60X13**.

PRICE (without optionals): **$2,599**

PERFORMANCE: **0-30** mph, **4.8** secs; **0-60** mph, **13.2** secs. Top speed **100-plus** mph. All times recorded on corrected speedometer.

CAR grooved through corners with "all the ease of a tomahawk through a soft scalp."

in this price range. It has a four-cylinder, high-compression engine which beats out 83 hp at 5300 rpm, using an aluminum head and twin carburetors. The whole job lands on the dock weighing a brown trout-and-a-half under 2,200 pounds.

But the big deal comes when the appointments are examined. The instruments, for example, are real instruments—items Detroit hasn't been able to afford in recent years. The upholstery on the two bucket seats in front is something the Fisher boys should take a look at; this is *real* upholstery.

Actually, this car might be rated by some idiots as a four-passenger convertible, though this would be stretching your imagination beyond the breaking point. Even the Rootes people, who make this job, refer to the rear seat as "a fully upholstered occasional seat with ample room for children." They fail to mention the children's age so I'll help them out—if they are much older than eight months, you've got trouble. There isn't enough room (when the front seats are pushed back) for legs plumper than pipe cleaners.

This would be a great bachelor's car—for the guy who lives in the city and goes to the country for summer weekends. That "occasional seat" is plenty big enough for your dog or a drunk friend who doesn't mind sprawling out across the entire seat [*Continued on page* 182]

UPHOLSTERY is real, says Tom, and there are bonafide instruments, not idiot lights.

TRUNK, considering size and type of car, is amazingly large. Spare is under shelf.

MORTON MURPHY and his traveling mailbox—a regular mailbox turned cablecar. Cowcatcher and other adornments were added from time to time at inventor's whim.

ELECTRIC MAILBOX

TRAMPING down a 200-foot slope to the road and climbing back up twice a day—to put outgoing mail in the mailbox and to fetch what the mailman left—was not the way for a retired electrical engineer. So Morton Murphy, of Brown County, Indiana, strung a clothes wire down to the road, slung his mailbox on it on rollers, let the box coast to the road. A towline to an electrically-powered windlass drew it back up. A signal to show when the mail was in completed the arrangement. "Saves 20,000 steps a year," says Murphy, proudly. •

MAILMAN pops post into the box at the roadside.

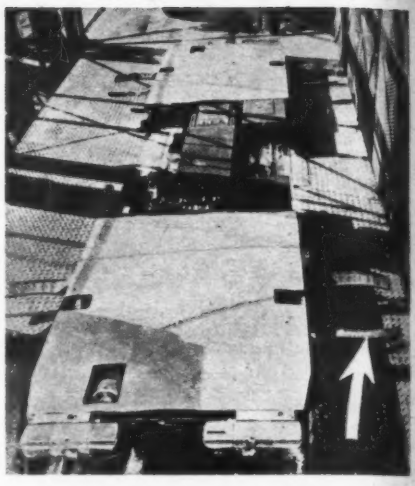
WAITING for the mail at house beats trudging for it.

MOTOR draws the mail uphill in easy 54 seconds.

FILE-AWAY PARKING

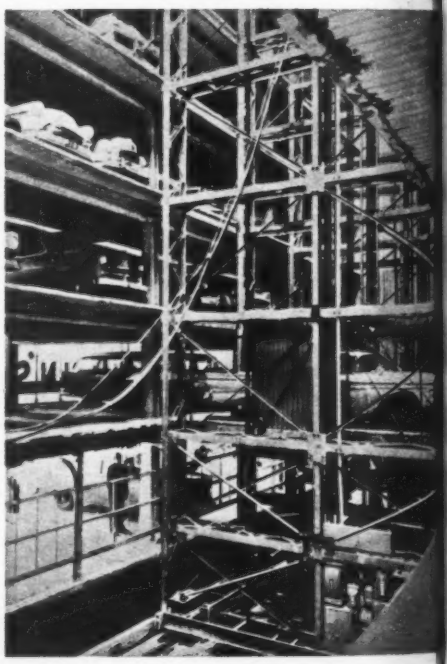
AT the new Bohmann Parking Center, a 10-story building in Portland, Ore., they file away your car with the ease of a room clerk popping a bill in a pigeonhole. You drive in, lock your car, pay up and walk away. Then machines take over.

The mechanical principle is fairly simple. Essentially the structure is two buildings with an alley between. The parking tower travels the alley from end to end; inside the rolling tower is an elevator. When a car is to be "filed," it is parked in front of the tower and a shuttle slides under it. Arms from the shuttle cradle the tires in a crablike grip; no part of the frame is touched. The shuttle will take anything from a Lincoln to a Volkswagen. The car is then slid onto the platform and an attendant, who travels with each car, directs the tower sideways and the lift platform upwards. The movement is rapid—the device can pick up a car and whisk it to the farthest point on the tenth floor and get back to the street level in 60 seconds. The 240-car structure can be taken down and put up again on another site if necessary.—*Edwin C. Henry*

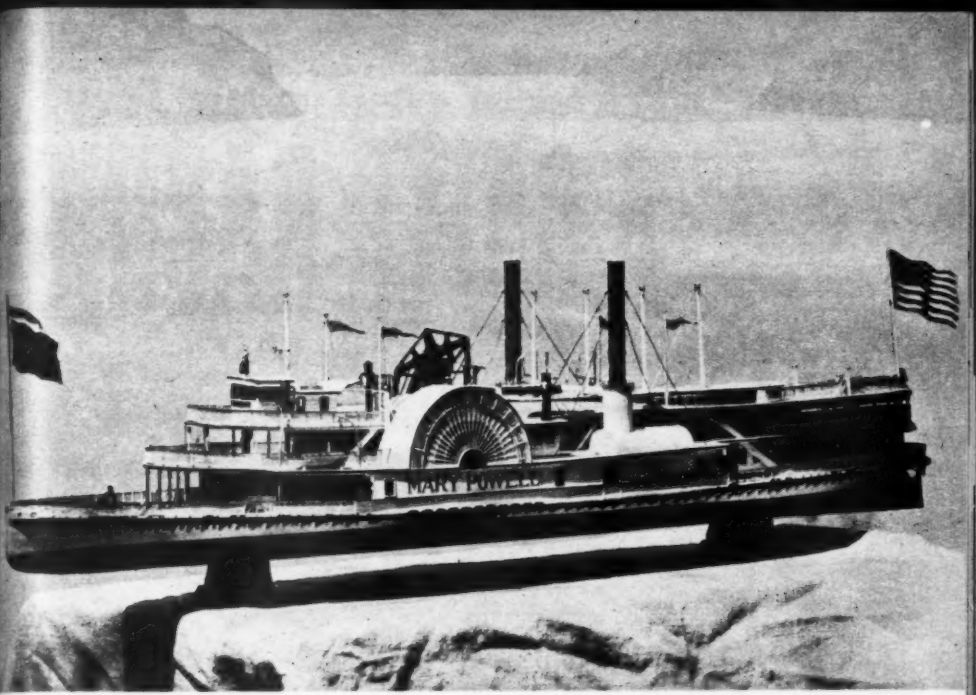


SHUTTLE LIFT with arms (arrow) extended. With arms in, it can slide under any car.

UPS-A-GERMAN-DAISY. Note clearance under car. Pick-up adjusts to size of car.



ROLLING TOWER takes car from parking bay. Note entrance gates at street level.



SCALE MODEL of the steamboat Mary Powell is now in museum of West Point Academy.

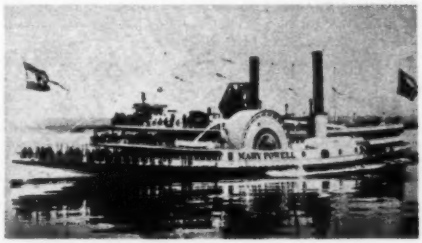
Sidewheeler For West Point's Navy

THE handsome sidewheeler shown above is a scale-model replica of the steamboat Mary Powell, known as the Queen Of The Hudson during her half-century of service from 1861 to 1919.

It is estimated that during her lifetime the Mary Powell traveled 1,150,000 miles on the Hudson River and carried 150,000 passengers yearly. The vessel operated 50 consecutive seasons and never had a serious accident. She was a favorite with cadets and officers stationed at the U. S. Military Academy at West Point, N. Y., and of honeymooners taking their first trip up the scenic Hudson to Newburgh, Poughkeepsie and beyond.

The Mary Powell was 260 ft. long and had an overall beam of 64 ft. The paddlewheels were 31 ft. in diameter, each had 26 buckets and turned 22 revolutions per minute.

The model, 37 inches long, was constructed to a scale of one-eighth-inch to the foot. It was built by steamboat authority F. Van Loon Ryder who in his youth worked on the Jacob H. Tremper, the Onteora and the Robert Fulton—all famous steamers that played important roles in the romantic days of steamboating on the Hudson. •



ACTUAL PHOTO of Mary Powell shows her on the Hudson in her prime, around 1888.

BILL FRANCE DESIGNS . . .

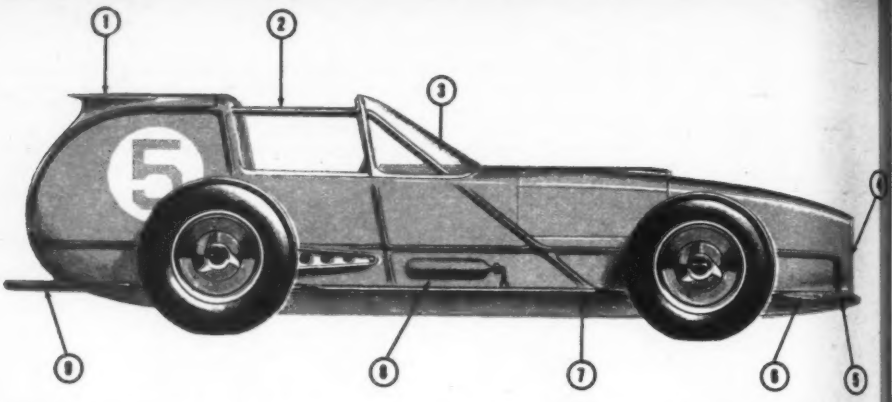
A SAFER RACING

INDIANAPOLIS-TYPE racing car has unusual ailerons for stability. See following page for complete diagram.

IG CAR

Bill France, who designed the unusual car shown on these pages, has had years of racing experience, both as a driver and as president of the National Association for Stock Car Auto Racing (NASCAR). His most recent accomplishment is the completion of the International Speedway at Daytona Beach, Fla., the fastest racing track in the world.

ALMOST all racing cars are dangerous, regardless of class or kind. Lives have been lost on all the great speedways of the world and at practically all the smaller tracks and road courses. These accidents almost invariably have resulted when the driver lost control of the car, either because of driver error or mechanical failure. Unfortunately, there is not much we can do about mishaps for which the driver is responsible. But we can improve racing cars, improve their safety, stability and handling at the super-speeds that



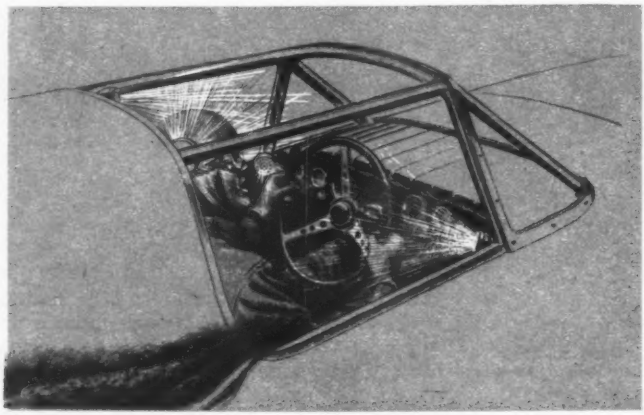
FRANCE-DESIGNED racing car has (1) top aileron to compensate for weight loss as fuel burns; (2) roll bars with carbon dioxide outlets; (3) bird-proof windshield; (4) automatic firedoors on grille and cowl vents; (5) rollers to prevent wheel climbing; (6) front ailerons; (7) side crashbars; (8) carbon dioxide carried in tanks fitted into the frame; (9) rear rollers.

are now becoming common at tracks and speedways all over the world.

Recently we completed the International Speedway at Daytona Beach, Fla. It is the finest and fastest 2½-mile racing track ever built. It makes possible higher speeds than have ever been known in competitive racing. But to take full advantage of this exciting track, high-speed cars will need definite changes, improvements that will enable them to be steered and handled properly at speeds averaging 30-100 mph faster than on other tracks.

One thing must be recognized: the need for better driver protection in high-speed racing cars has been disgracefully ignored. At present there is no minimum weight limit, and as racing engineers strive to build lighter cars, driver protection and car reliability have suffered. I have seen racing cars so light and fragile that a slight bump causes them to disintegrate. On other occasions, after a bad wreck, light cars have been so completely demolished that the cause of the accident could only be guessed by track officials.

For the protection of the driver and to enable today's racing cars to obtain super-speeds *safely,* I have listed ten steps I feel strongly must be taken if racing is to continue to flourish in America. I urge all drivers, designers, racing executives and racing fans to consider these suggestions carefully. I believe that unless these or similar steps are taken, auto racing in America faces a very [*Continued on page* 192]

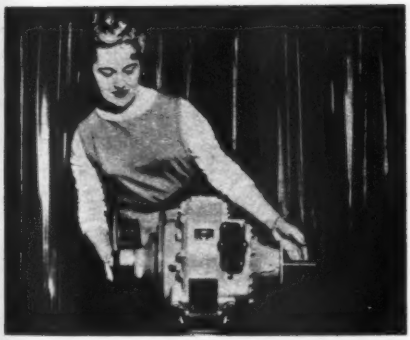


COCKPIT is sprayed with water from corner nozzles in case of fire. Water is pressurized by carbon dioxide in frame tanks.

Now See This!

ELECTRONIC LIFEGUARD recently introduced by Minneapolis-Honeywell sounds an alarm when anyone—grownup, child or pet poodle—falls into or otherwise enters an unattended pool. The submerged sensing device (black arrow) reacts to sound or water vibrations set up by a fall into the water and the alarm (white arrow) goes off. Alarm can be placed at a point away from pool. Device can be adjusted so that hand or foot splashing will set it off. System can be installed in a pool for under $200.

PLASTIC RELIEF MAP of the United States shows the shape of the land as it really is. Detailed 50-state map shows 4,000 geographic names, includes 2,000 cities and towns, 1,000 rivers and lakes, 150 national parks and monuments and over 200 mountain ranges and peaks. Handy map index almost the size of the map slides out from the back and locates all of the place names shown. Map comes ready to hang, costs $10. Aero Service Corp., 210 E. Cortland St., Philadelphia 20, Pa., makes and sells it.



NEW WONDER ENGINE developed by Curtiss-Wright with NSU Werke of Germany is a rotating combustion engine with only two moving parts—the rotor inside the combustion chamber and the crankshaft. An automotive carburetor supplies gasoline and air to the chamber through a side wall port: as the rotor turns the mixture is compressed, fired by a single sparkplug. Exploding gas delivers power to the crankshaft through rotor. Noise is low, premium gasoline unnecessary. Hp range: 100-700.

WATCH CHRONOGRAPH that does all its jobs with only a watch crown instead of the usual clutter of pushers is the latest triumph of Swiss watchmaking. The one shown here has a tachometer for telling rpm and a telemeter for telling how far away a cannon is—and it can also time Uncle Ed from the couch to the dinner table. Models are available with pulsometers and production meter scales. Eliminating the pushers around the rim not only looks better but makes the instrument watertight.

MONEY MAKING IDEA

THESE PONIES NEVER LOSE

HORSE'S MOUTH gives it a highly spirited appearance.

SHORTLY after World War II Nickolaus Klein, a Yugoslav citizen, pulled out of his native land and made for Stuttgart, Germany, where he soon hit a winning streak with the ponies. The ponies were of the lovable type called hobbyhorses, famous for getting nowhere. But they brought Klein all the way from Stuttgart to Chicago.

Klein takes pride in trying to make his ponies more lovable than any others on the market. Kids not only ride them, they pet them. A Klein rocking horse feels like real horse because it is covered with genuine horse or calf hide, kept soft and lustrous with a secret liquid preservative. Manes and tails are real.

Klein starts a horse by nailing together a wooden skeleton, the most important part of which is the carved head. Then burlap is stretched around the skeleton and stuffed with wooden chips. Klein then pounds the stuffing into shape with a large paddle. Over the burlap go three carefully cut pieces of hide, soaked in preservative. Klein stretches and stitches the hide into place with great care. The hide dries taut, making as attractive, convincing and durable covering as any horse could have. Ears, main and tail are sewn on next, and the horse is then mounted on its wheeled platform.

The rocking horses cost $35 for the smallest size, and go all the way up to $133 for the largest which is 56 inches (or about seven hands). Klein's shop, in case you want a horse, is 2962 North Lincoln Avenue, Chicago, Ill.

—*Howard M. Greenwald*

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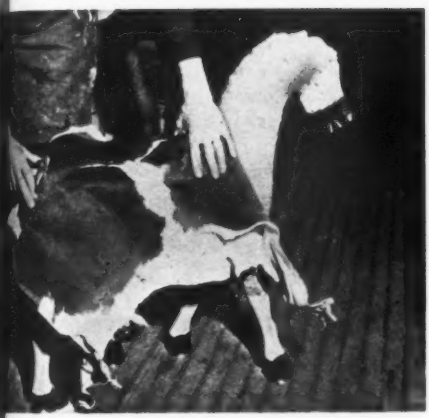
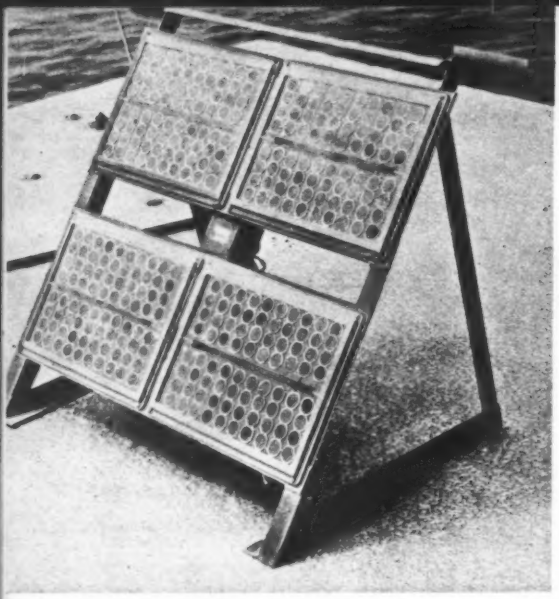
BURLAP is tacked to wooden skeleton. This is a 56-inch, $133 job.

CHIPS OF WOOD are packed into the burlap, which is then sewn up, pounded into shape with a big paddle.



HIDE, soaked in preservative, goes on over burlap form, shrinks smooth and taut. Below, wheels go on platform. Rocker is removable. Stance shown below costs extra.

FINISHED HOBBYHORSE can be rocked, rolled, washed, curried, petted and loved.

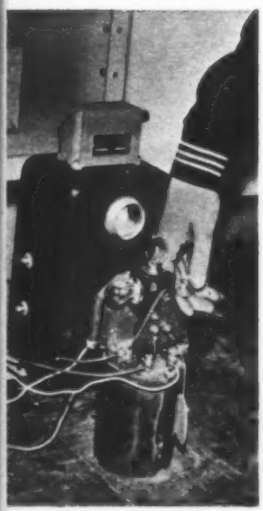


SOLAR CONVERTER has been compared to four neatly filled cookie sheets. The tilting bar at the top of the unit keeps seagulls from alighting on it.

FOR more than two years the lighthouse at Angel's Gate, Los Angeles Harbor, has been flashing solar-powered signals to ships at sea, using a unit developed by Hoffman Electronics.

Composed of 320 cells of almost pure silicon, shaved down to 16 one-thousandths of an inch in thickness, linked in chains and sealed in an anodized aluminum base, the unit looks most like sheets of cookies just out of the oven. Every day at dawn a sun-relay switch turns off the flashing light and cuts in the cells, starting a flow of electricity into two 100-amp, 6-volt storage batteries. On overcast days output of the converter is diminished but fog does not affect generation. Ultimate goal of the Coast Guard experiment—an automatic signal for unattended use in remote locations. •

SUN-POWERED LIGHTHOUSE



DEAD BULBS are replaced automatically.

ANGEL'S GATE lighthouse—an old-style tower on Los Angeles Harbor breakwater.

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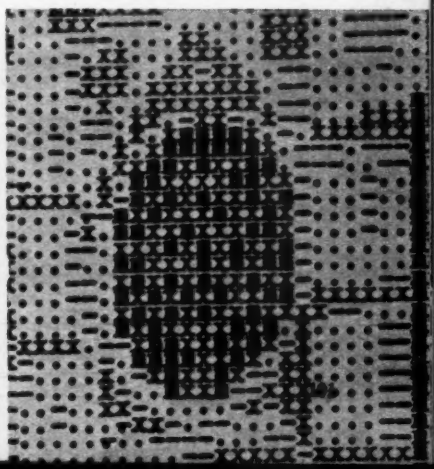
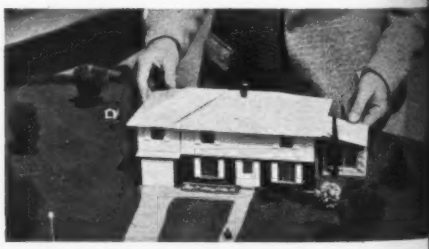
hunt-and-peck ARTIST

ALL day Guillermo Mendana Olivera works as a stenographer in Leon, Spain; every night he types pictures. Samples of his work shown here are, moving clockwise: typings of Ike, of Mendana himself, a detail from a picture of a church, and the Puerta de Alcala in Madrid. Each picture takes about 70 hours. Mendana uses small o and x and periods, dashes and commas. He starts with a paper covering all but a sliver of a photo; as the paper moves down he copies a line at a time. •



MAGNETIC MODEL HOMES

RESIDENTS of Long Island, N. Y. can actually see the way their homes will look after anticipated improvements are made by house remodeler Herbert Richheimer. Salesmen at his Museum of Modern Home Improvements at Hicksville click on to the magnetic model homes a dormer, garage, playroom or other additions for the benefit of a prospective customer. •



MAGNETIC MODEL, left, is about to get another room over garage and a sun porch on opposite end of house. Right, here's how the improved house will look to customer.

PAT BOONE sings into microphone. Before actual recording starts, he croons some test notes for the benefit of engineer.

Pat Boone CUTS A RECORD

Illustrated by J. George Janes

TEEN-AGE singing idol Pat Boone has sold more than 25 million records over a five-year period which is quite a record in itself. Here's how Pat cuts a "biscuit" for his fans.

Boone, like all recording stars, first sings to a magnetic tape, not once, but many times. The best of these tapes are cut and spliced together to make what is called a composite master tape.

Music from the tape is re-recorded to an acetate disc. The disc gets a thin coat of silver and is immersed in a plating

ENGINEER in control panel uses singer's test notes to adjust his complex equipment before actually recording Pat's new song on the tape recorder.

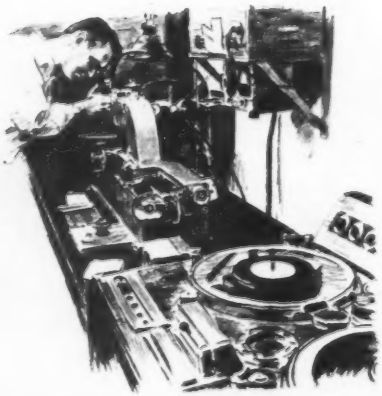
tank to make a metal master at the RCA factory.

A metal "mother" mold is made from the master and gets an audible inspection. A nickel stamper is then made from this mold to do the actual manufacturing of records in quantity. The nickel stamper is mounted in an automatic hydraulic press and a "biscuit" of hot plastic inserted. The press molds the hot plastic into a record.

When the center hole has been made and the edges trimmed, a machine produces a smooth, finished edge.

The record is now ready for final inspection, packaging and distribution to record stores. •

HIGH-QUALITY tape recorders, usually two, as shown above, are used to reproduce the singer's voice. When recording session is over, right, Pat and recording officials sit around and listen intently to the playback.



MUSIC from the tape is re-recorded on an acetate disc. This disc has fine grooves cut into its plastic surface by machine.

"MOTHER" MOLD is made from master, then carefully separated by hand at RCA plant. A nickel stamper is then made from "mother."

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PLASTIC which has been prepared and run off in sheets is being made into "biscuits" here. This is done after audible inspection of the "mother."

LABELS go on nickel stamper in hydraulic press. The disc is made with a hot "biscuit."

RECORD is placed on a machine which produces smooth edge after center hole is made.

BOONE fans relax and listen to crooner who has sold over 25 million records.

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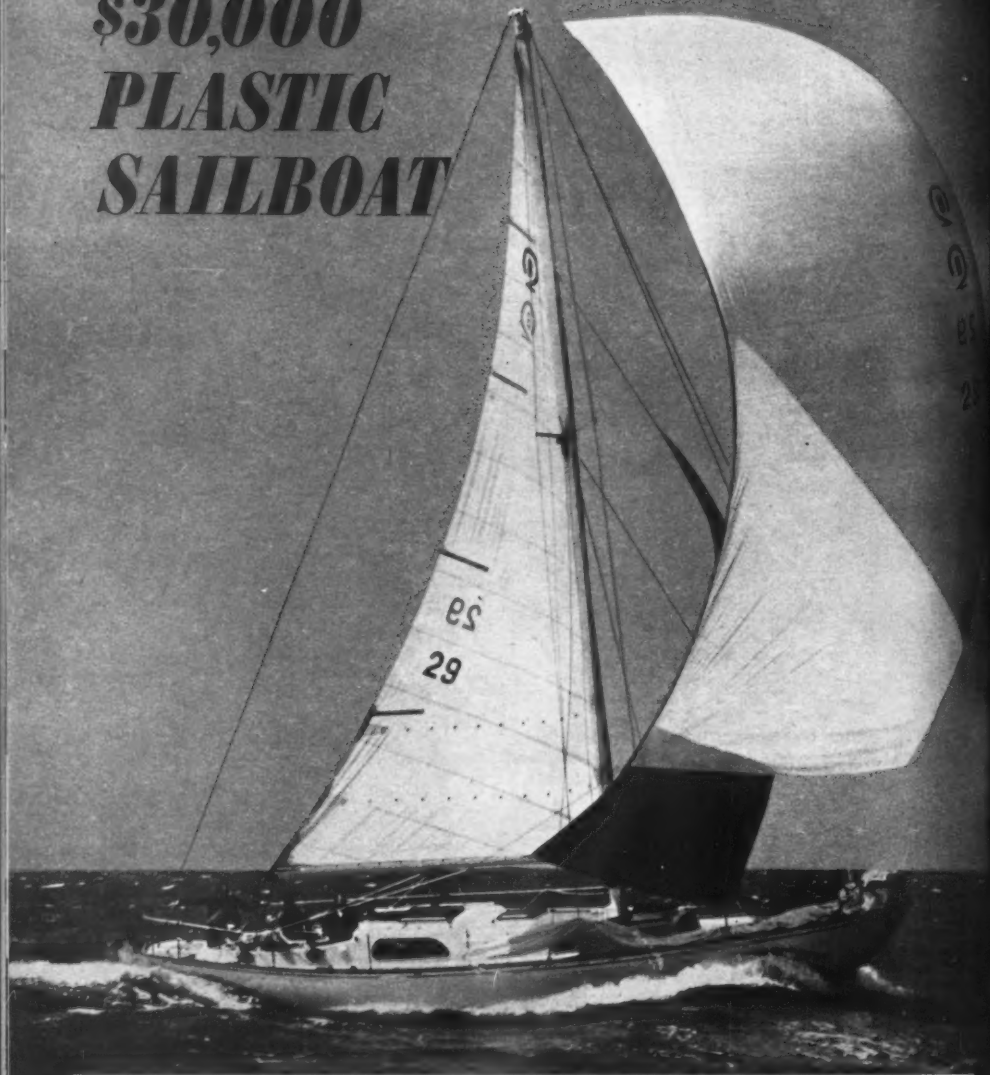
$30,000 PLASTIC SAILBOAT

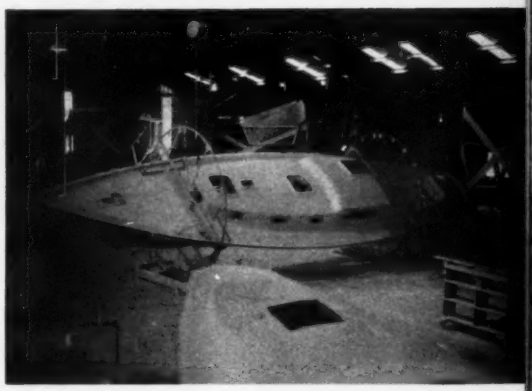


THIS beautiful ocean-going sailboat zipping along with spinnaker set is the racer-cruiser Bounty II, a 40-ft. fiber glass pleasure craft equipped with an auxiliary 30-hp engine. The Bounty has a one-piece hull and one-piece deck, reinforced internally with structural bulkheads. The unusually spacious cabins and galley provide comfortable cruising for six, and sleek lines enable her to outperform boats of conventional construction. •

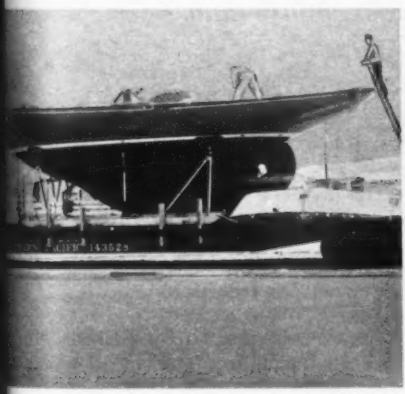
BOLTS of fiber glass are soaked in resin before building of Bounty gets underway.

ROLLERS of wet fiber glass stretch the cloth inside one section of the hull mold.

HULL HALVES are bonded chemically. The entire hull is produced in eight hours.



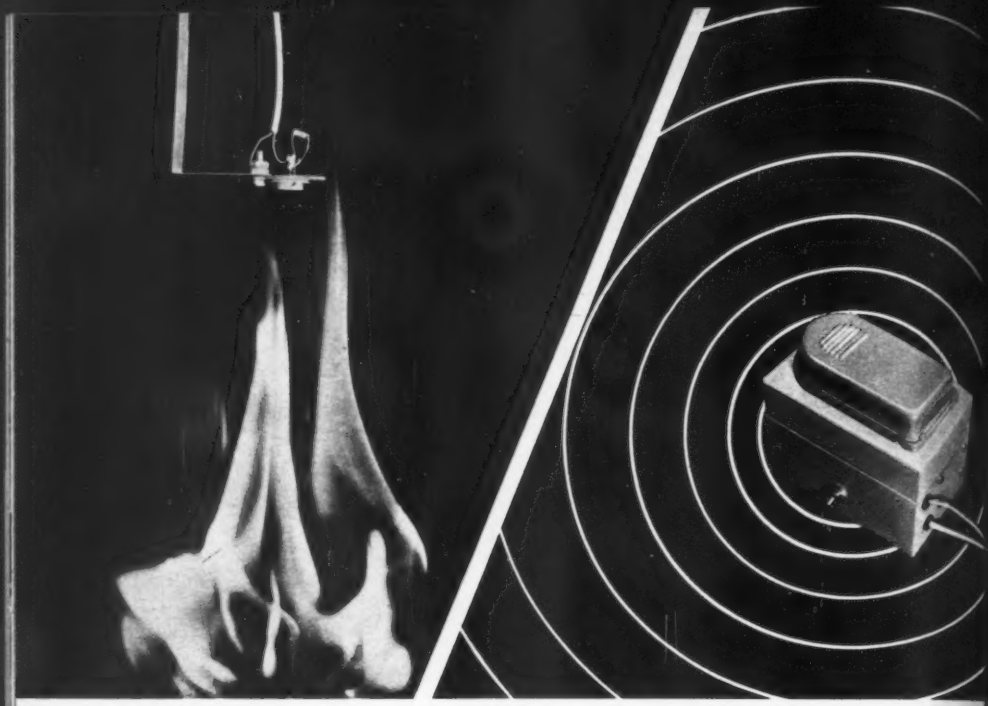
PLASTIC deck and cabin top are ready to be installed on hull like "lid on a can."



FINISHED Bounty is shipped complete with aluminum mast, Dacron sails, engine, gear.

GLASS CLOTH, held by VP Frederick Coleman, is one of toughest materials known.

Aeromarine Plastics Corp., Sausalito, Calif.



TRANSISTOR FIRE ALARM

COMPONENT PARTS of alarm mechanism are shown before assembly in metal file box.

This device may one day save your house—and your family.

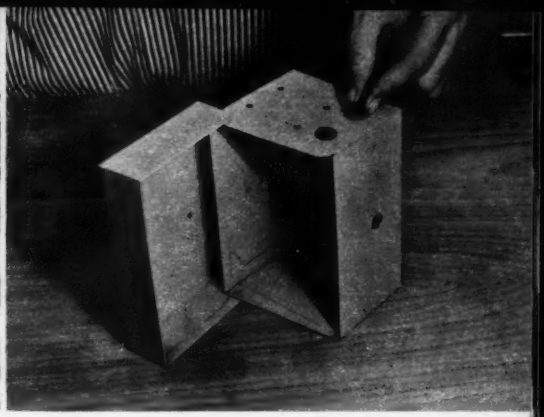
By John Michaels

HEAT increases transistor current flow—that's the operating principle of this fire alarm.

The unit is designed so that normally a negligible current flows through the relay circuit, but not enough to close the relay that sets off the alarm. It is only when the transistor is heated (135° to 185° F.) that current flow increases, closes the relay and triggers the alarm.

Begin by drilling the required holes in the 4x6-inch metal file box housing. Then refer to the diagram at right to make the brackets for the transistor and for the seven-pit socket from one-inch

WHEN DRILLING HOLES, avoid denting the box: bear down gently on the drill press.

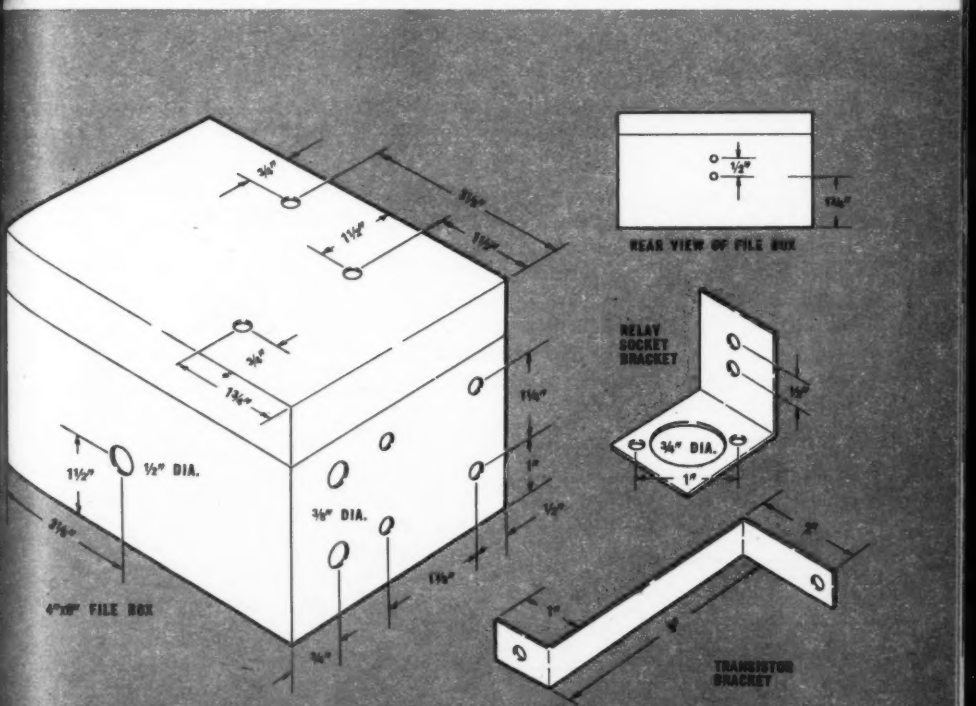


LINE rims of holes in the file box with rubber grommets to prevent chafing wires.

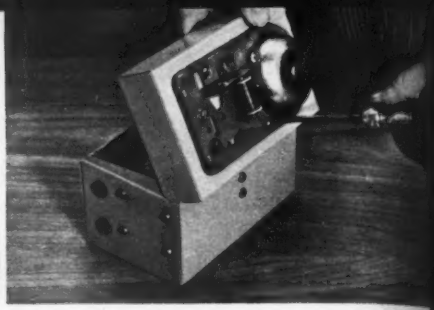
aluminum strips. Mount bell, transformer and socket bracket with quarter-inch, No. 8-32 roundhead screws.

All connections are soldered, then insulated with electrician's tape. Solder the half-watt resistor across the base and emitter legs of the transistor. The case of the 2N307 transistor is the collector leg and is connected to the relay.

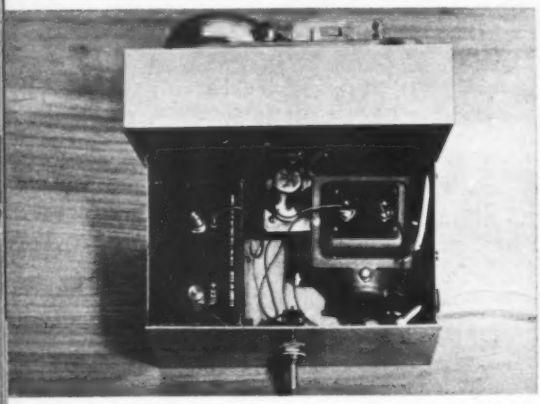
Test the unit by plugging in the transformer, closing the toggle switch and holding a lighted match under the



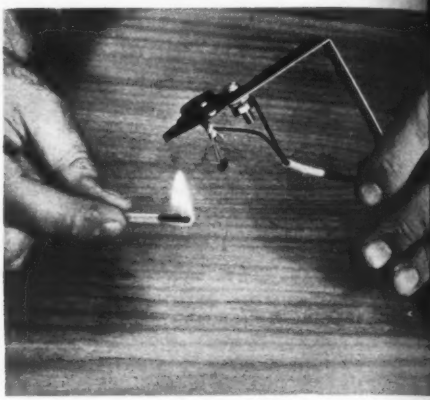
MINIATURE SOCKET takes the K1 relay; it is wired prior to mounting to bracket.



FASTEN ALARM BELL or buzzer to top of file box with half-inch roundhead screws.



ARRANGEMENT of the components is shown in this top view of the completed assembly.



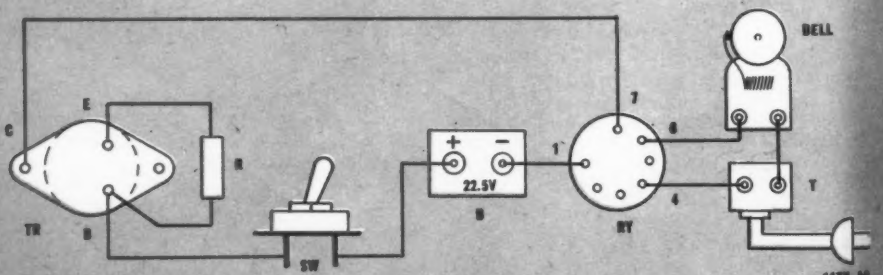
"ANTENNA" of mechanism is the transistor. It can be tested as shown with match.

transistor to trip the alarm mechanism.

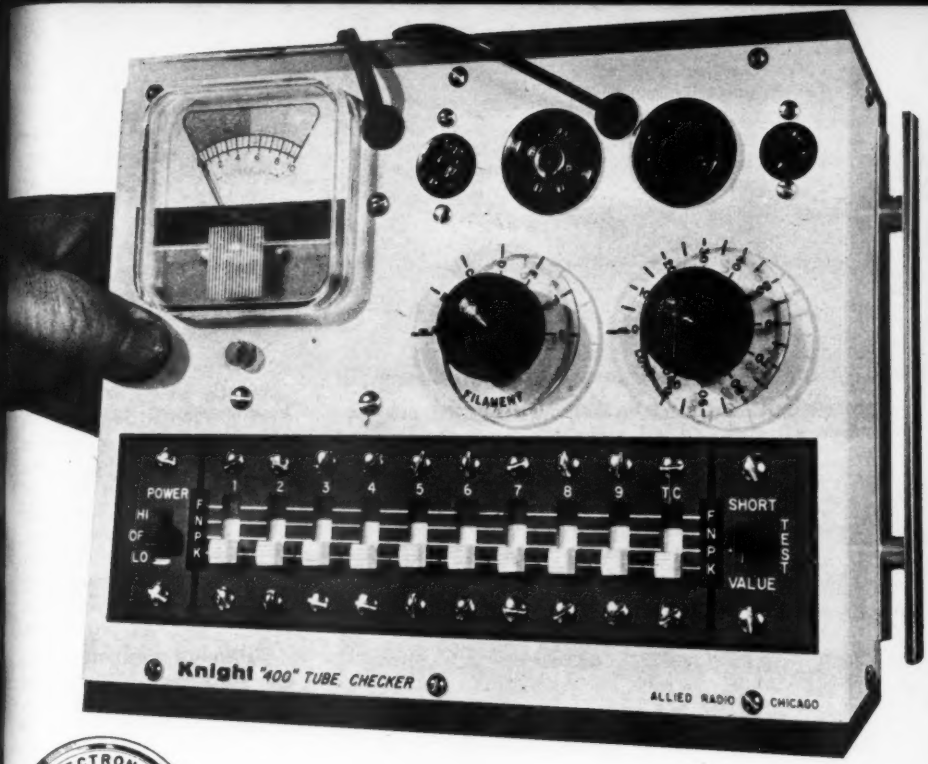
For complete protection install a resistor in each room, wiring the circuit in parallel. Check the circuit to see that no current leakage increase exists that would set off the alarm at room temperatures. Test base resistors of varying values until the alarm operates at the correct temperature. •

PARTS LIST

B —22½V. Battery, Eveready No. 763.
Bell—Buzzer or Light may be used instead.
*RY —Relay, Potter & Brumfield, SM5DS, 900 ohm, 24V. DC, (fits 7-pin min. tube socket).
TR —Sylvania 2N307 Transistor.
R —10K ½w. Resistor.
SW—S.P.S.T. Toggle Switch.
*The SM5DS relay has contacts rated at two amps for non-inductive load. If heavier current is required, operate a heavy-duty relay from the contacts of the SM5DS.



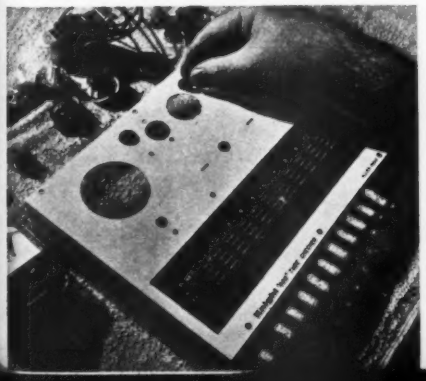
WIRING DIAGRAM. Note that bell is powered by house current. The battery is only used to "sensitize" the transistor.



ELECTRONICS MI DEPARTMENT

BUILD YOUR OWN TUBE TESTER

Save money on service calls by checking radio and TV tubes on a tester you build from a kit.

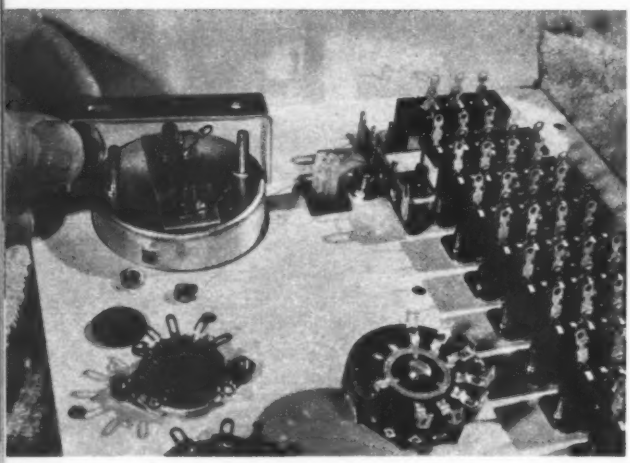


By Ken Murray

HOW many times has your radio or TV set failed when a favorite program was coming up? And how many times have you waited a couple of days for a diagnosis and had to pay for it be-

FIRST step is to lay out and mount those parts which go on front panel.

CONTROLS are mounted on the front panel with nut and lockwasher on inside and a securing nut on the outside.



GOOD-BAD METER is inserted from front side of the panel and secured with a bracket and nuts at the rear.

sides? Then the trouble is usually just a bad tube which you could have replaced yourself if you'd only known how to find it. Well, even if you don't know an amp from an ohm, you can build your own tube tester from a $19.95 kit now on the market.

Made by Allied Radio Corp., 100 N. Western Ave., Chicago 80, Ill., the Knight "400" Tube Checker kit is easily assembled by following the instructions supplied. You just perform a simple step, check it off and proceed to the next one. Before you know it, the job is done and you've had fun doing it. The only tools required are a pair of long-nose pliers, diagonal cutters, a screw driver and a soldering iron.

When the tester is finished, you set all the selector slide switches in the position marked *K* on the panel and plug the line cord into a 105- to 125-volt, 60 cycle, AC outlet. If the local voltage is between 115 and 125 volts, the *Power Hi-Lo* switch is set in the *Hi* position. If the voltage is between 105 and 115 volts, the switch is set in the *Lo* position. If you're in doubt, the *Hi* position is used. From there on, testing a tube is a snap —or just a few snaps of selector switches.

Neatly fitted into a slot in the side of the case is a tube chart. You pull this out, find the number of the tube you're about to test, turn the *Filament* switch to the position indicated, insert the tube in the appropriate socket and then set the selector switches in order given on the chart.

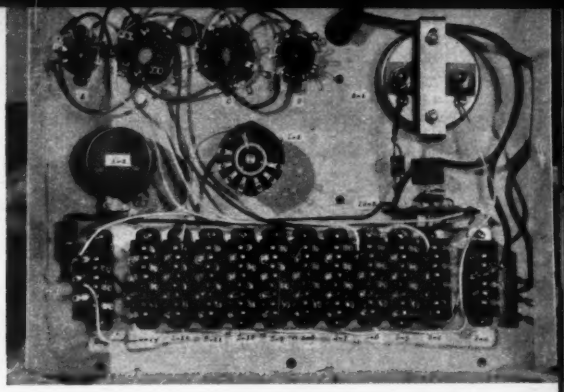
Filament continuity is the first test. When the switches are set, the neon indicator light should glow. If it doesn't the filament is broken or faulty.

The next test is for shorts. In this case, setting the switches should *not* cause the neon light to glow. If it glows steadily, there is a short in the tube and it should be discarded.

If no short is found, you can proceed to the value test. The *Load* control on the panel is set to the number given on the tube chart and the necessary selector switches are also set. Then the *Short-Value* switch is held in the *Value* position. If the pointer of the meter moves to the green section of the scale, the tube is good. If the pointer moves to the red section, the tube is not emitting properly and should be replaced.

That's all there is to it. By making quick checks

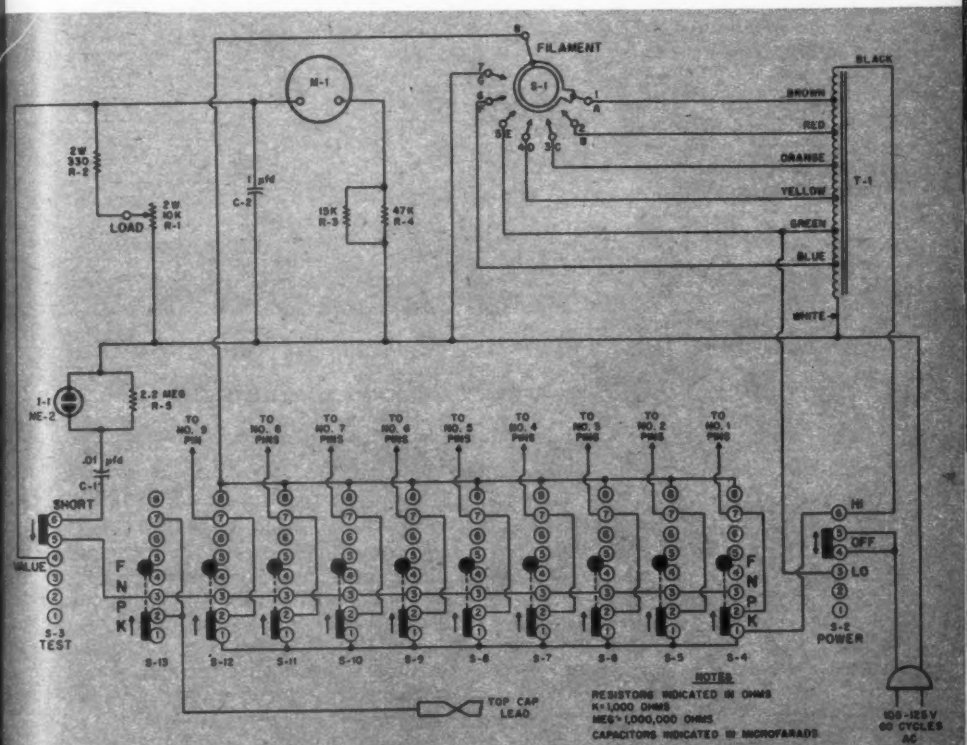
SOLDERING requires care. Heat the joint thoroughly and flow solder on.



FOR SIMPLICITY, job is divided into three separate wirings. This is after first wiring.

on the tubes in your set, you can learn if you really need a serviceman or have a problem you can solve yourself just by slipping a new tube into a socket.

To increase the scope of your testing, you can easily make a continuity tester for checking the condition of resistors and condensers. The attachment is an eight-pin tube base with a length of lamp cord run in through a hole in the side and soldered to the insides of the pins numbered four and five. For a finished appearance, the bottom of a black rubber [*Continued on page* 169]



All parts in diagram are called out in instructions supplied with kit.

ELECTRIC DOOR OPENER

NOW THEN, this is a conversation stopper, not a conversation piece, when your guests see how this door opens itself in front of you.

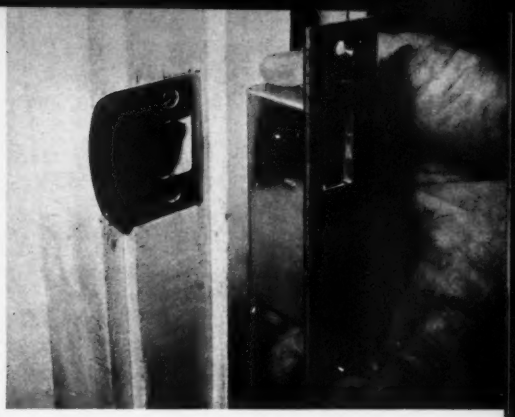
A foot tap is all that's required to open this connecting door between kitchen and dining room.

David X. Manners

"LOOK, Ma, no hands!" An electromagnet inside the door release retracts a catch from the latch, and presto, an ordinary tension spring at the top of the door pulls it open. Heart of the system is an electric door release installed as a replacement for the lock's striker plate. After you pass through, you can push the door shut behind you with shoulder or elbow.

You see, the couple living in this house vowed that when they bought their new home it would have a separate dining area, not a part of the kitchen—and a connecting door so that cooking odors would not permeate the dining room. An excellent idea, but the door became a headache; always closed to keep out the odor of cabbage and fish, it became not only a nuisance to open, but

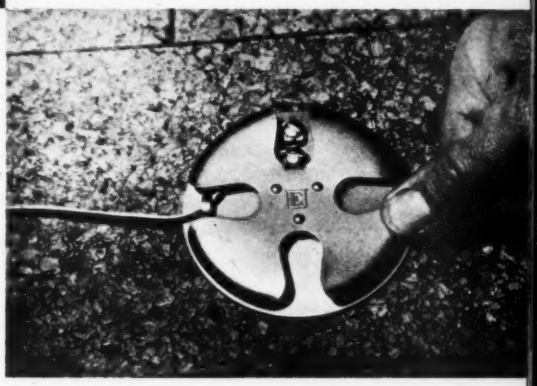
THE OPERATING SWITCH, one on each side of the door, is concealed under a mat.



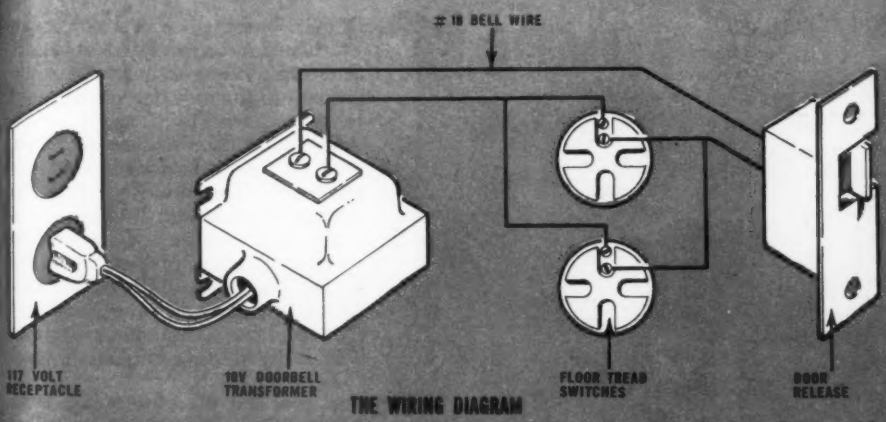
THE MORTISE-TYPE door release being installed as a replacement for striker plate.

at times an actual impossibility when the Mrs.' arms were laden with food. A double swinging door was out of the question because of lack of room on the kitchen side, and, secondly, a latch was required so that their baby could be kept out of the dining room.

Commercial door openers cost far too much for the average homeowner. However, you can assemble and install this simplified one for less than $15. It's safe and easy to install as it operates on low voltage. All required parts are manufactured by the [*Continued on page* 162]



THE SWITCH. Pressure on any part of the housing will operate door release.

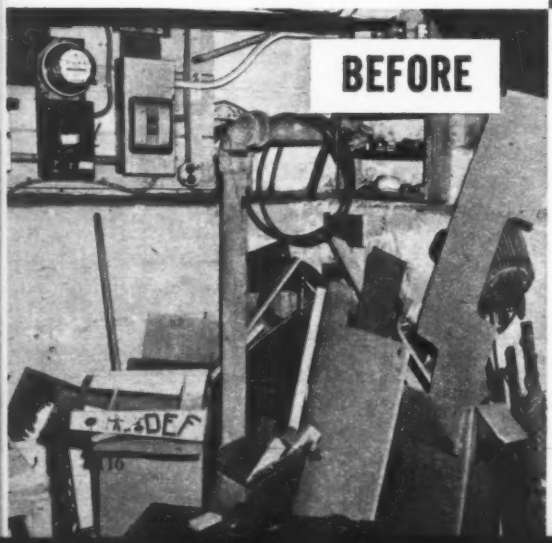


THE WIRING DIAGRAM

RUMPUS ROOM

Using various combinations of wall-covering materials, today's cost-conscious home owner can renovate any room without ruinous forays into hard-earned family savings.

By R. J. Capotosto



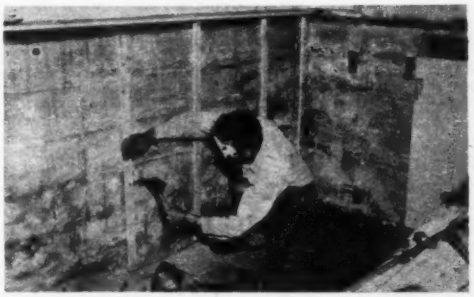
THIS basement recreation room turned out so well that it is now a tossup as to whether more time is spent in the new den or the main living room upstairs.

We used three interesting new wall surfacing materials that are so realistic that a close look is required to distinguish them from real wood, marble and stone. The walls of the den proper are faced with Masonite Misty Walnut panels and self-adhesive Sculpture Con-Tact in a cut stone pattern. The built-in desk-bookshelf is of

Can you find the pipe in the large picture? It is hidden by the plant.

Misty Walnut with Marlite in a black marble pattern for the desk top and trim.

The furnace and utilities areas were partitioned off with Weldwood Expand-A-Grille lattice work (available from U.S. Plywood dealers). Two 4x6-foot sections of the wall are on hinges. The upper halves consist of airy grillwork and the lower sections of Masonite hardboard faced with simulated stone. Access is gained by "opening the wall" and walking in.



ANCHORFAST NAILS are used to secure the 1x2-inch furring strips to the foundation walls.

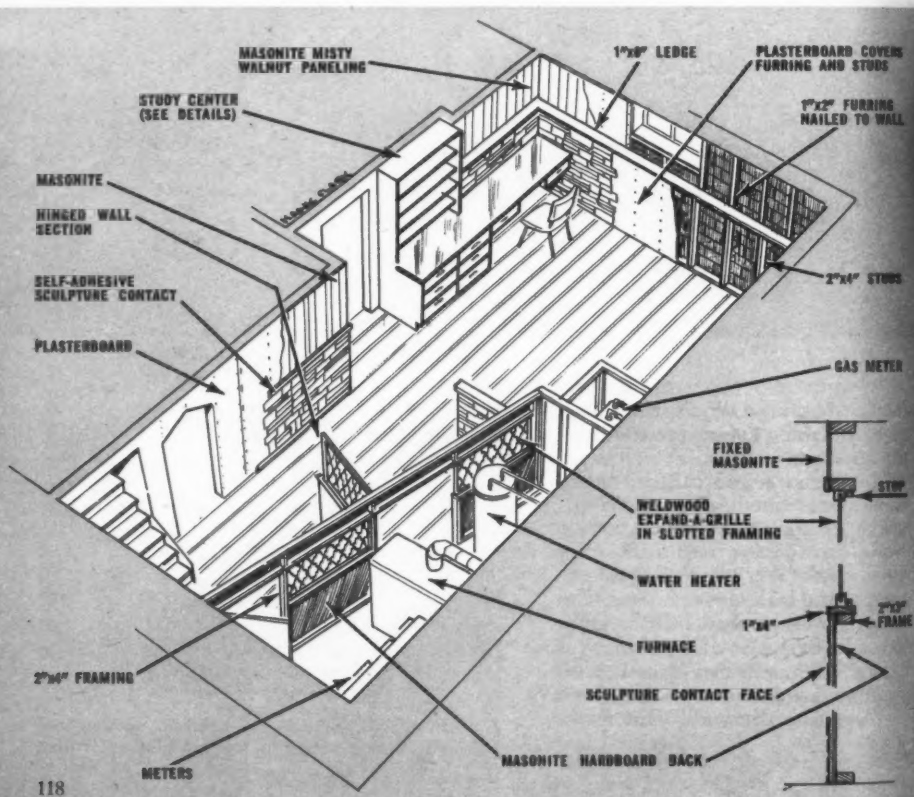
The main construction procedures outlined here will help give you a working knowledge of how to go about starting your den. You'll probably have to alter some of the dimensions since each room must be approached on the terms of its own characteristics. But here's the way *this* job was done:

Interior partitions were constructed of 2x4's, then the cement block foundation walls were furred with 1x2's. The ledge formed by the recessed foundation wall was put to functional use by finishing it off as a mantle.

Electrical wiring was next. Plenty of outlets were installed around the room flush with the finished wall surfaces. The wire used was No. 12 BX. This gage was chosen to permit use of heavy current drainers such as an electric heater and whatever additional appliances the future might bring.

Inasmuch as the self-adhesive Con-

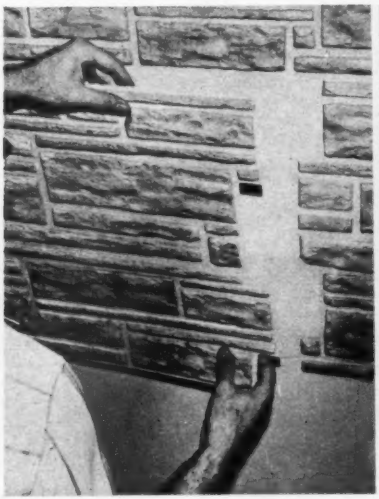
FURNACE AREA partition is 2x4 framing with Masonite bottom, Expand-A-Grille top.

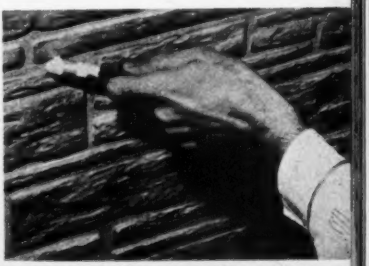


UTLET BOXES should be mounted wooden blocks to bring these units flush with the completed walls.

PLASTERBOARD covers large areas quickly and makes a good surface for adhesives.

TO APPLY simulated stone, remove backing to expose adhesive.

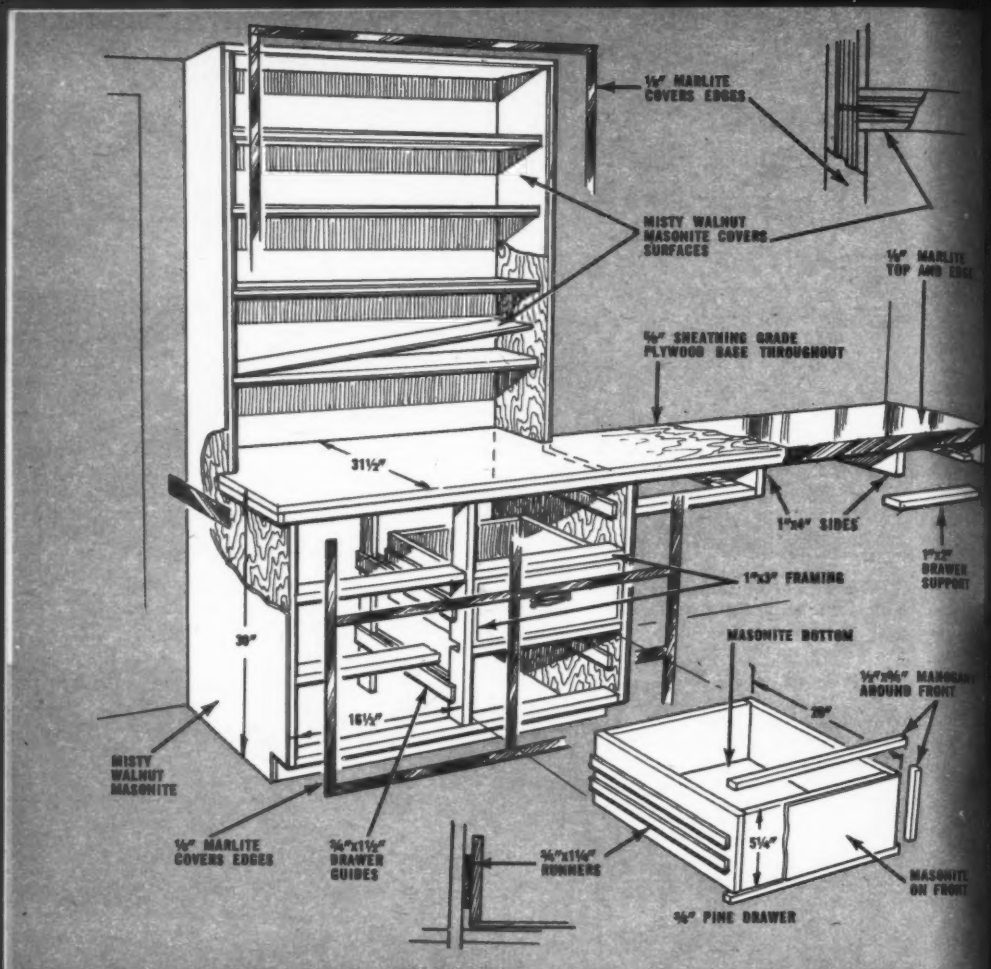




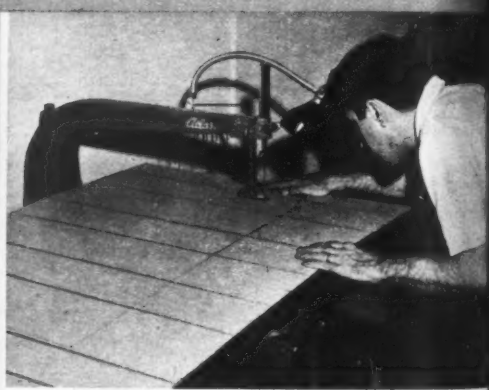
EVEL LINE guides first row of Sculpture Con-Tact; straightedged "mortar" pieces are used to form corners; press top-to-bottom in applying each section, then press in the "mortar" grooves with a cloth-covered stick; use a sharp knife to cut outlet openings.

Tact requires a smooth surface for best adhesion, economical plasterboard was chosen as a base. The only exception was on the hinged walls. Here hardboard panels were used for greater strength.

The first wall covering to be applied was the Sculpture Con-Tact, a tough, durable plastic material formed in relief to look like stone. With the protective backing removed, the sheets were sim-



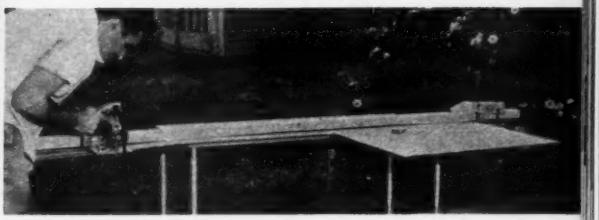
MARK OFF the Marlite, then cut it back-side-up using a saber saw.



IF A JIGSAW is used, cut the panels face up to avoid chipping the edges of the Marlite.

MARLITE framing panel around window is fitted, then secured with adhesive.

ADHESIVE is spread on the back of a panel.



SHEATHING PLYWOOD is used for the built-in desk. Note clamped 2x4 which guides saber saw.

SHELVING is screwed into place between uprights after daubing the joints with glue.

ply pressed into place to form the bond.

Next to go up was the Misty Walnut Masonite. These are random-grooved panels with a wood-grain finish. They were cut ⅛-inch shy to allow for expansion before the adhesive was applied to the back of the panels with a grooved spreader.

The built-in desk was

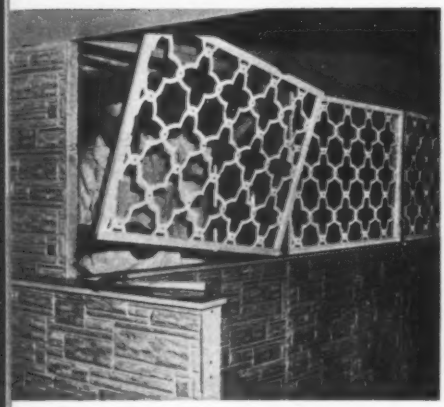
PLYWOOD is then hidden with Misty Walnut cut to size:

CUT end pieces carefully for fitting around shelves.

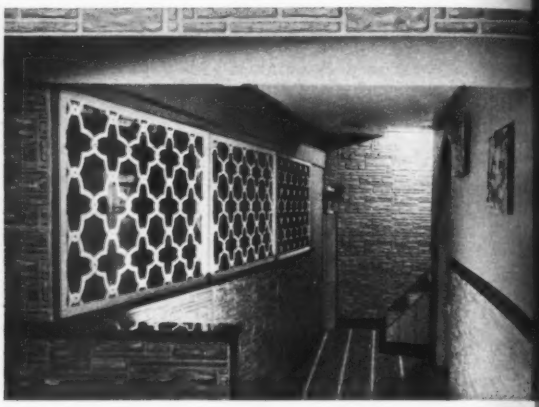
LEVEL off the floor by troweling Ken Patch No. 14 over all the low spots.

DAMP floors require application of special adhesive; we used Kentile No. 10 here.

HALF the floor should be tiled at one time; tile from a centerline and work toward the walls.



GRILLWORK is tested for fit before screwing it into place in frames.



APPROACH to room shows partition built to hide the furnace area without restricting air circulation.

constructed of ⅝-inch sheathing-grade plywood. A saber saw facilitated making the long cuts in both wood and hardboard.

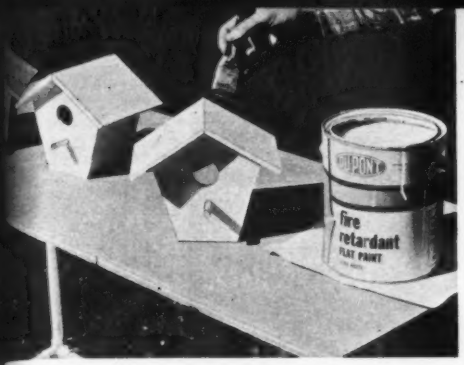
The wood members of the desk were assembled with glue and screws before the whole unit was secured to the wall. Marsh adhesive was used to laminate the hardboard to the wood, with the assistance of clamps. The Marlite desk top was similarly secured using adhesive and clamps.

The desk drawers were constructed of ¾-inch pine with Masonite bottoms and the front panels faced with Misty. All strips of Marlite used for the edging were planed smooth and the top edges lightly sanded. Contact cement was used to attach all strips to the desk as well as to the baseboards and the mantle.

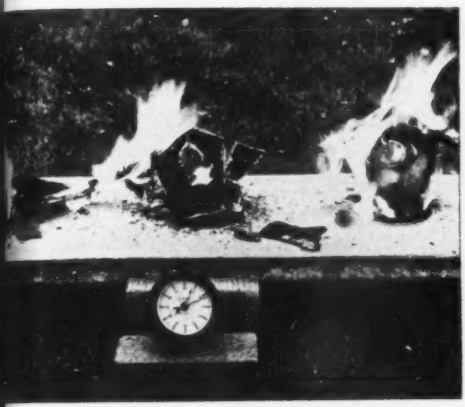
Weldwood Expand-A-Grille decorative grillwork was used on the swinging wall panels. The special slotted molding was cut to form a rectangular frame of the desired dimensions. With one side left temporarily open, the unique expandable grille was adjusted to fit the frame, then cut to size and inserted. When the fourth side of the frame was attached the unit was screwed into the panel.

The last step is to install Kentile Vinyl Asbestos Tile on the floor. With the project thus completed, you can look forward to many pleasant hours in this comfortable basement hideaway. •

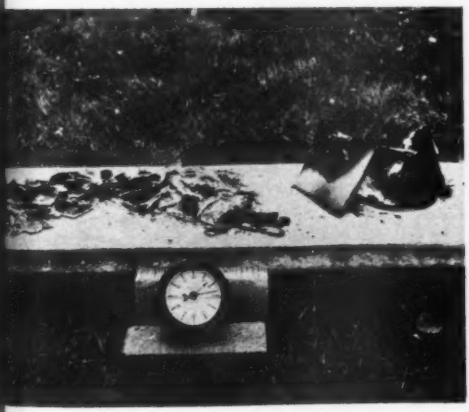
FRESH PAINT TIPS



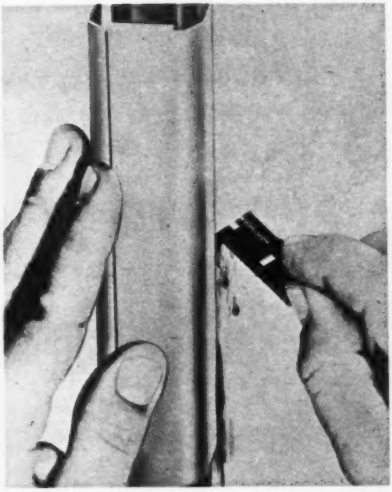
BIRDHOUSES (left to right) get no finish, regular paint and Dupont's fire retardant paint . . .



. . . are simultaneously ignited to demonstrate that the new paint slows down the burning . . .

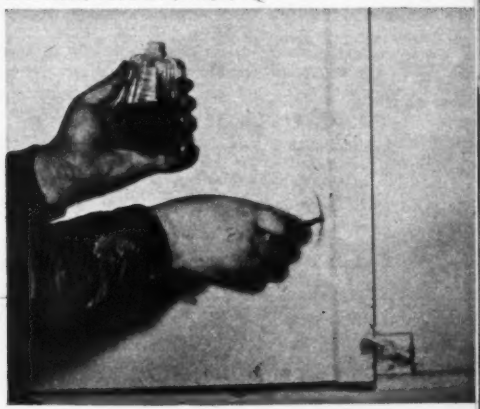


. . . and even protects some wood—a fact which can give fire fighters time to save a house.



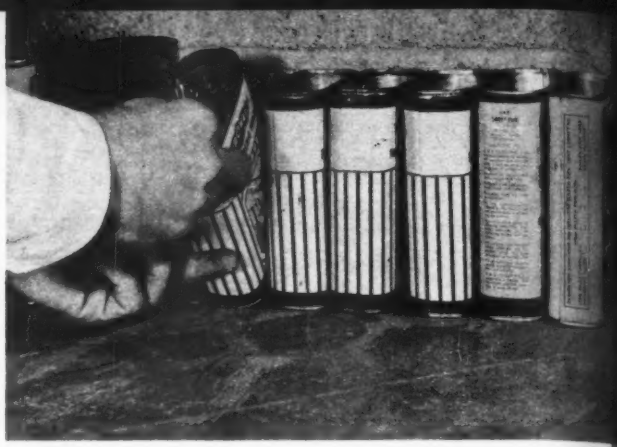
METAL GUIDE for scraping off excess paint adjusts to fit window frame; $2.50.

C. G. Paskaly Co., Box 96, Temple, Pa.

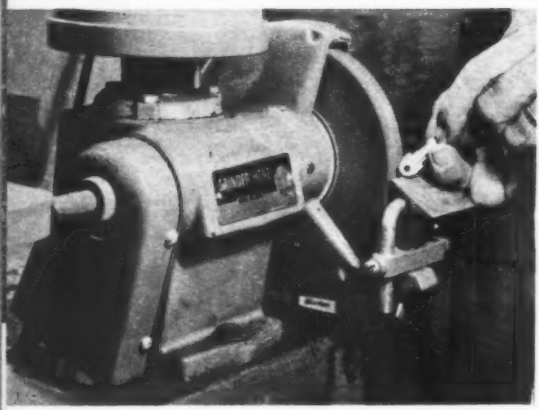


LEFT-OVER paint in nail polish bottle is handy for the inevitable touch-up.

HOME And SHOP TIPS

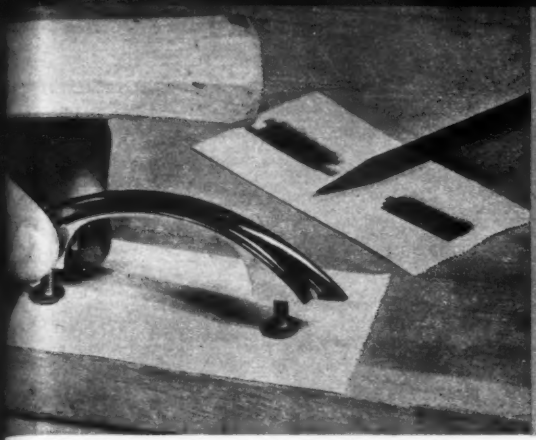


REMOVE LIDS from empty rectangular tins of the same size and use these cans to store nails, nuts, bolts, washers, etc.

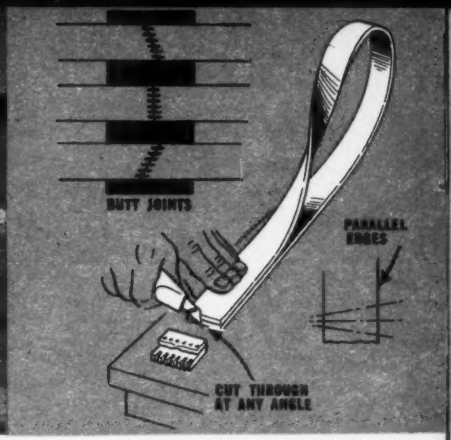


CUT DOWN the bulk and weight of your key ring by first drilling a new hole close to the backstop of each key; then saw, grind, and file down most of the keys' sides and tops.

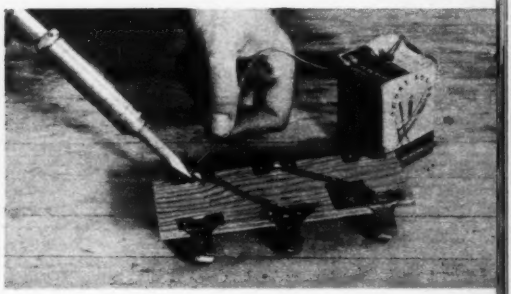
FREDDIE FUMBLES



PENCIL-RUBBED paper set face down on drawer front will mark screw holes for drawer pulls.

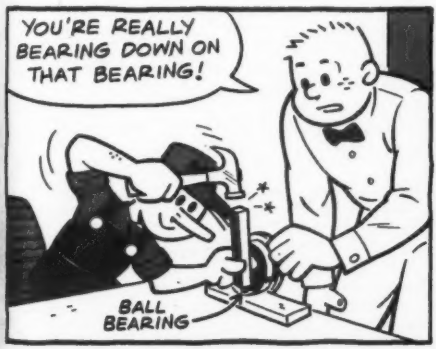


TO BUTT belt ends, twist belt once, lay one end over the other, then cut.



BATTERY CLIP connects three D cells in series. Contacts are window shade brackets mounted to wood base and wired as shown. Solder leads to the first and last terminals.

Send Freddie Fumbles your idea of a good short-cut, time-saver or safety device in your work, whether it be in the home, shop, office or farm. Each tip accepted will be paid for at the rate of $10. Naturally we cannot acknowledge or return the ones we cannot use. However all will be carefully read and evaluated. (Those which we can use in other departments of MI will be paid for at our regular rates.) Please send in your ideas on a post card only. Address to Freddie Fumbles, *Mechanix Illustrated*, 67 W. 44th St., New York 36, N. Y.

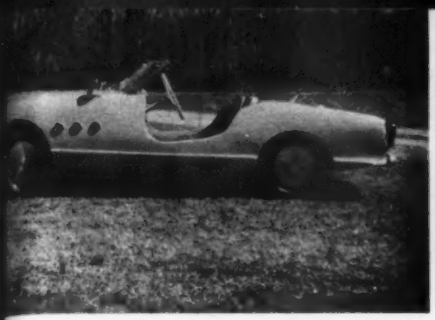


Golden Hammer Award Winners

HOUSE of 1,800 square feet has such features as hot water heating with well water for summer cooling, a central vacuum system with outlets on each floor and an intercom in every room. George R. Larsen, Bristol, Wis., did entire job except for the masonry.

Each craftsman whose project is shown receives a 24-karat gold-plated Hammer and a Workbench Award Certificate. Runners-up will be sent a beautiful gold-plated Golden Hammer Tie Bar or MI's Certificate of Merit. So send us some *black-and-white photos, with negatives,* and a full description of your latest project. Photos of your workshop are also eligible. Send all entries, with return postage, to MECHANIX ILLUSTRATED Golden Hammer Awards, 67 West 44th St., New York 36, N. Y. Entrants are advised that MECHANIX ILLUSTRATED cannot accept responsibility for customs charges, duties, taxes, etc., levied against Golden Hammer and Golden Hammer Tie Bar winners outside the United States.

The following craftsmen have been awarded GOLDEN HAMMER TIE BARS for their projects: William J. Hurley, Astoria, L.I.C., N. Y. . . . Eugene Wisniewski, Toledo, Ohio. . . . Bob Percival, Redlands, Calif. . . . A. Gandenberger, Cincinnati, Ohio. . . . William E. Pope, Jr., Ocean Springs, Miss. . . . G. M. Tolson, Knoxville, Tenn. . . . Demetri Constantine, Oxford, Mass. . . . Carson Berton, Kansas City, Mo. . . . John Woodson, Kansas City, Mo. . . . Victor H. Camponovo, Memphis, Tenn. . . . John D. Sipkosky, Highland, Ind. . . . Fred Balda, Mount Vernon, Wash. . . . Joe Young, Beaumont, Texas. . . . Emil Belsky, Antigo, Wis. . . . Robert P. Bryan, Jacksonville, N. C. . . . De Forest Rushing, Albuquerque, N. M. . . . Alfred Coretti, Utica, N. Y. . . . T. S. Warbin, Port Arthur, Ont., Can. . . . Stanley Hoffman, Vandergrift, Pa. . . . James Gilreath, [Continued on page 186]



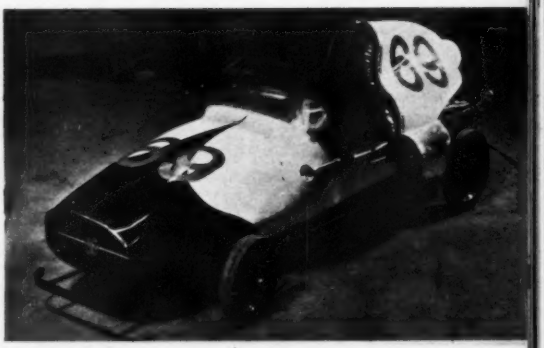
SPORTS CAR built from old auto parts by Marvin Whiteside, Anniston, Ala., took 14 months of spare time, cost less than $300.

BABY ACE plans in three 1955 issues of MI were used by Fred Pries, San Leandro, Calif. His building cost was under $800.

TRACTOR was built by D. Curtis Wik of West Islip, N. Y., for his two children. It crawls at safe pace with 1½-hp engine.

TIN LIZZIE has aluminum body, 12-volt generator for motor, goes two mph. It's the work of Paul Falck, West Palm Beach, Fla.

CABIN CRUISER is 25 ft. with an 8-ft. beam, was finished in two years by Virgil Patterson, Covington, Ky. Total cost was $2,000.



MODELED after a racer, this 85-in. car does 25 mph. Paul H. Johnsen, Washington, D. C., was the builder, spent under $110.

YOUR NEW VALIANT

CAR CARE

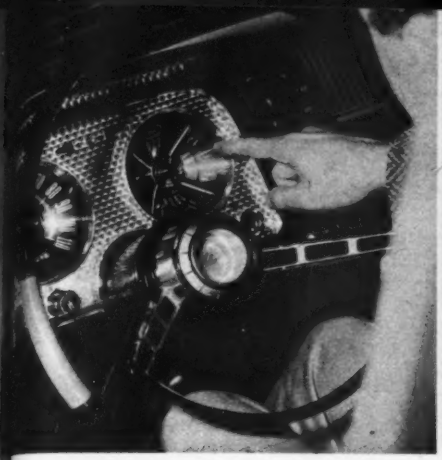
Are you one of thousands who own the new Valiant? Then read these special tips on care and handling.

By Frederick C. Russell
Member Society of Automotive Engineers

SO much about the Valiant is designed to spare an owner the usual weekend chores that we're hard pressed to list some of the things which call for special attention. But here goes.

The body of the newest compact from Chrysler is dipped a total of seven times in special pre-painting cleansing and coating baths to make the enamel finish just about weatherproof. With a special unitized body and frame, squeaks and rattles are held to a minimum. Then too, there's an ammeter in the instrument cluster so that you can watch the electrical system at work. But remember that the best of cars is at the mercy of owner habits. Typical is the 13-quart cooling system. The engine comes from the factory with a 180° thermostat. This is all right if you use ethylene glycol antifreeze but it had better be replaced with a 160° unit if alcohol is used.

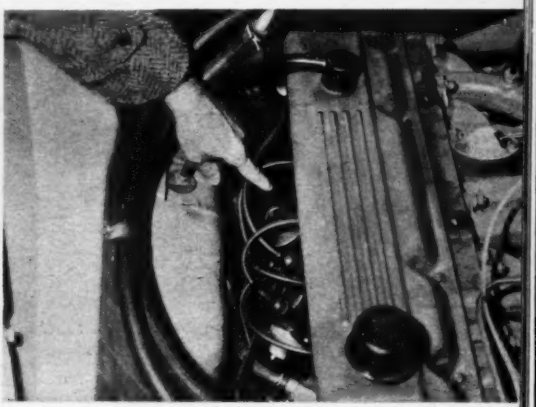
The Valiant's 101-hp engine is an overhead-valve six with a crankcase oil



AMMETER is included on instrument panel for a constant check on electrical system.

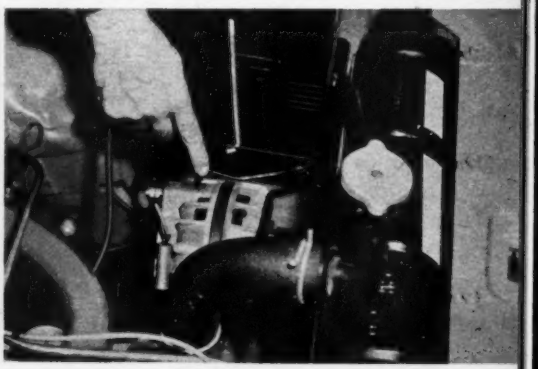
LIFTING the emblem plate in the center of the grille releases catch on the hood.

REPLACE standard 180° thermostat with 160° unit if you use alcohol antifreeze.

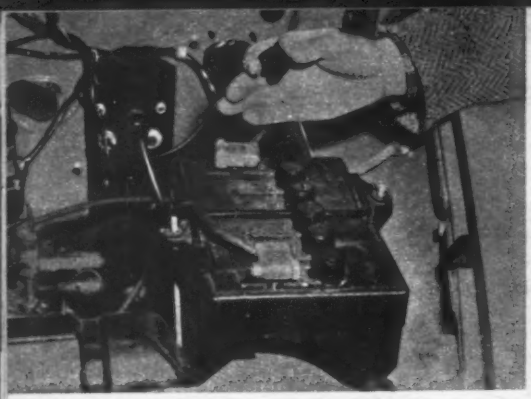


OIL FILTER is disposable type. Replace it with new one at end of 5,000 miles.

CAP on the gas tank may be lost easily if it is not properly screwed into place.

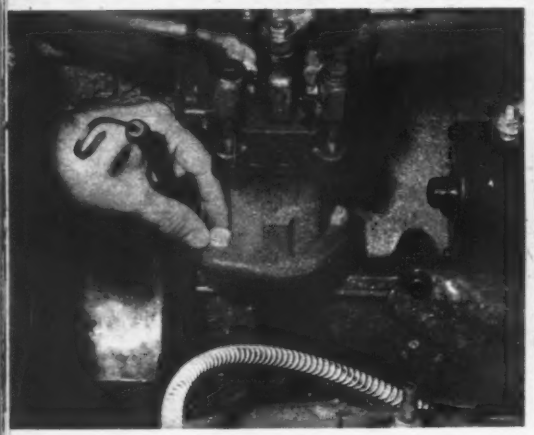


ALTERNATOR, used instead of generator, supplies more current at low engine speed.

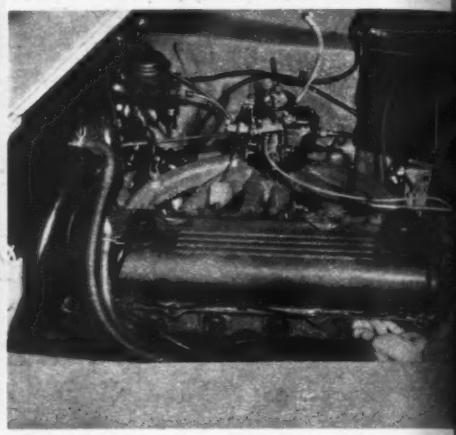


BATTERY is close to hood, has special vent caps to protect hood from corrosion.

GOOD RIDE is provided if the tires are pumped to a pressure of 24 lbs. when cold.



EARLY models have brass manifold studs; they're replaced with steel if they fail.



VALVE compartment tilts 30°. No oil will leak unless cover is improperly installed.

MANUAL transmission lever is mounted on the floor within easy reach of the driver.

SPARE WHEEL is kept in a well in the trunk. Note wedge for use as wheel chock.

apacity of four quarts; an extra quart hould be used when it is equipped with n oil filter. The oil filter is disposable nd the entire unit should be replaced t the end of 5,000 miles. You'll like the osition of the oil dipstick which is easy o see and reach because of the way the ngine tilts at a 30° angle to help bring own the hood line. I can't say as much or the neat-looking gas cap which is lush with the side of the left rear fender nd which can come off unless properly crewed into place. It's in a vertical po-

TRUNK storage space in Valiant is demonstrated by adult and two boys. "Hi'ya Tom!"

sition and won't stay put if a careless filling station attendant doesn't tighten it after filling the tank. Incidentally, speaking of that canted engine, don't feel that it is likely to leak oil from the valve compartment. All V-8 engines have cylinders so tilted and owners have found that any leakage is usually due to over-tightening the covers. This makes them buckle.

My vote for the prize feature of Valiant's under-the-hood equipment is the use of an alternator instead of a conventional generator. This alternator delivers AC which is then converted to DC by six silicon diode rectifiers on the housing. By means of this switchover, a higher current output is obtained at lower engine [*Continued on page* 173]

SERVICE TIPS

from Detroit

Studebaker, beginning with car serial numbers 60S-30816 and 60V-22278, is installing a slide-type fastener on the sides of convertible tops. This serves to attach the top flap to the rear top side rail at the rear quarter and will reduce "ballooning" at higher speeds.

You can get an idea of the number of miles your plugs have gone by measuring the gap across the electrodes. The average spark plug wears about .001 inch for each 1,000 miles the plugs are in operation.

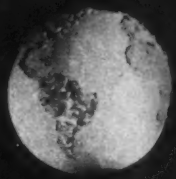
Cadillac has incorporated automatic brake adjusters in the 1960 models. These will keep the brake pedal at a constant height throughout the life of the liners.

You can remove rust spots from automotive chrome with a new palm-size sponge being marketed by Buick. Called Buick Rust Eraser, the non-acid, non-alkaline sponge is ready for use after soaking in water.

If the starter solenoid to starter cable on your '60 Dodge becomes entangled in the front suspension, the trouble may be eliminated by securing the cable with an insulated clamp (Part No. 581523) to the left front fender shield. Mount the clamp so that it will not exert any abnormal routing or stress upon the cable.

To increase the load-carrying capacity of all '58 and '59 Imperial models by five per cent, install Part No. 2201550, Rear Spring Second Leaf Service Package, in preference to new springs of the same specifications of those already on the car.

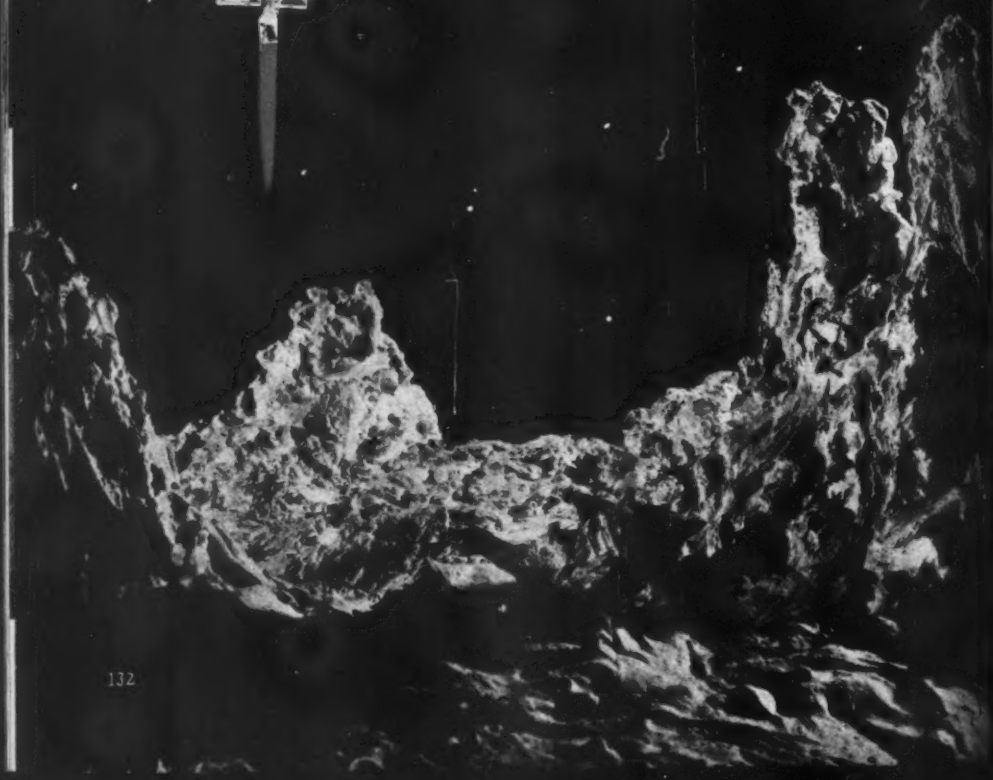
SPACE-AGE TABLE TOP

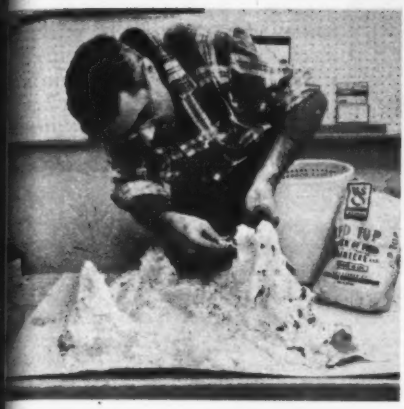


By Tim McCoy

Shoot your own space probe using props you can find in the kitchen.

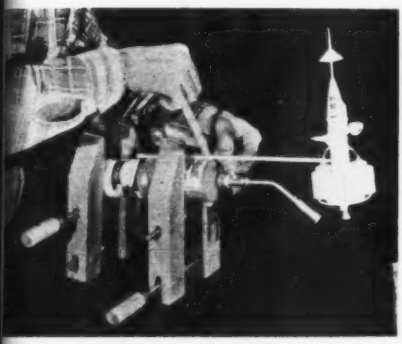
FOR a stimulating change of pace in pursuit of your favorite hobby, why not move into the Space Age with some table-top photographs of the wide starry yonder. Let your imagination roam and you'll find there's no limit to the productions you can dream up. In this case we





EALISTIC MOONSCAPE is made by pour-ng plaster over crumpled newspapers.

PLANET EARTH is formed by dabbing plastic wood in land areas outlined on a ball.



FLAME of Bernzomatic torch positioned under model rocket simulates jet exhaust.

can truly say that the sky's *not* the limit.

Materials for your Space-Age table top are obtainable from local hobby and department stores. These include plastic models and inexpensive prefabricated kits of missiles, space vehicles, moon ships, satellites and launching platforms made by Revell and Ideal. Other props, such as plaster for your table-top moonscape, buttons for flying saucers and cotton to simulate exhaust gases are readily available in most households.

Backgrounds of starry infinities can be created by punching small holes in a sheet of back-lighted paper, or by sticking pins into a backdrop of black velvet. Magazine or book illustrations or your own enlarged photographs of the sky can be used. You also can purchase special photographic murals of the sky from leading observatories.

Plaster of Paris poured over forms of crumpled newspaper makes a good moon surface. Sifted dirt will serve as soil around launching pads, strips of paper as roads, sand as gravel and flour or corn starch as snow. The cotton used to represent rocket exhaust should be touched with a bit of oil for added realism. Oh, yes, you'll need some thread with which to suspend the props.

The basic equipment required includes your camera, a light meter, fine-grain film with enough speed to take comparatively small f-stops, and one or two floodlight bulbs which can be screwed into gooseneck sockets. You should also have a tripod or similar firm base for the camera. Finally, a close-up lens will be needed and—if you prefer them to photo floods—flashbulbs.

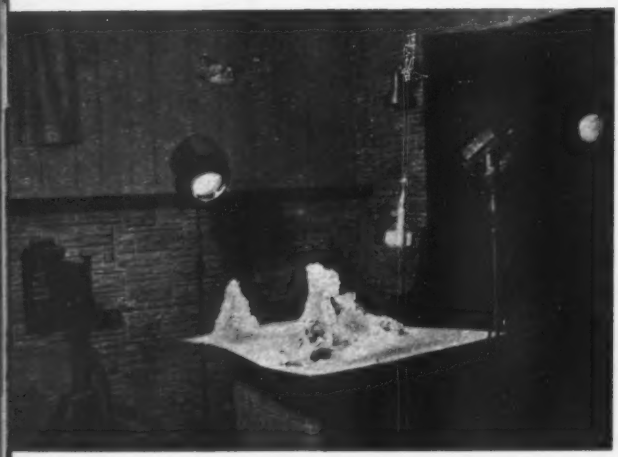
Although the camera work is important, you needn't be an expert photographer to get the kind of pictures that are both realistic and exciting. Any good camera will do the job. However, you must be more careful than usual in focusing and take into account that peculiarity of close-up photography, parallax: when one picture is seen through the viewer while the lens of the camera

CONCEAL torch and clamps under some black velvet, but be careful to keep cloth away from torch nozzle.

takes a slightly different picture.

You can compensate for parallax by having someone else sight from the side and tell you just how much to tip the camera to aim the lens directly at your subject. If you use a single-lens reflex camera (which lets you sight through the picture-taking lens), you won't encounter this problem. A ground glass camera is ideal for this work.

The average close-up may be taken at a distance of from 18 inches to three and a half feet. While few cameras will focus at distances less than these, any adjustable camera can be fitted with an inexpensive close-up attachment. These come in vari-



GENERAL VIEW of set-up shows moonscaped table top under approaching rocket, and a distant Earth.

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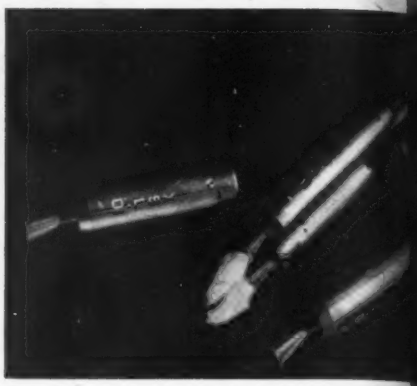
ous strengths, the most powerful of which lets you focus a lens with a normal, near-focus limit of four feet as close as 11 inches. Using a combination of lens attachments you can get as close as six inches. However, the closer you get with any lens the shorter becomes the depth of field; so you should measure the distance from the lens to the subject before each shot.

When shooting a picture like that on the title page, you will find that the props will have to be positioned over a rather wide distance in order to achieve the correctly proportioned size for each object. The distance between the moonscape, which is nearest the lens, and the Earth, which is farthest from the camera, is approximately five feet. This raises quite a problem, for even with the smallest aperture there does not exist sufficient depth of field to render all objects in sharp focus.

Such being the case, you must turn to *multiple exposure* for the desired results. Focus and expose each object separately; this means making several exposures on one sheet of film. Here's the procedure: While one part of the scene is being photographed, the other parts are masked out (black velvet works well for this purpose). With the camera focused on the moonscape and the rest of the scene in darkness, the first exposure is made. Then camera and lights are refocused on the spaceship for the second exposure. Next the torch is lit, all lights are turned off, and a third exposure is made of the flame. This procedure is repeated a fourth time for

CLOSE-UP details the weird configurations of "moon's" surface. Starry background are the heads of numerous white-painted pins stuck into black velvet.

LIGHT focused on the launching pad creates proper glaring effect as model rocket is readied to blast off for outer space.



ONCE INTO SPACE the rocket discards its power pods. Use cotton wadding to simulate exhaust gases from rocket thrust chambers.

ROCKET speeds toward (a photograph of) moon's surface. Note black thread—later retouched out of picture—holding rocket.

photographing the Earth. Note: If yours is a modern camera which is foolproof against making more than one exposure per film, simply make separate negatives and sandwich them for printing.

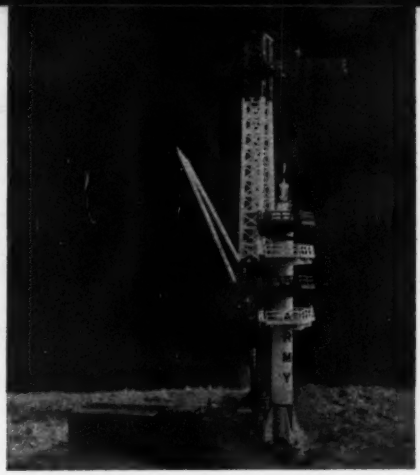
Keep your lighting as simple as possible. Flashbulbs are easy to use but they do cast shadows. To avoid this problem, bounce floodlights off a low ceiling above the table. Make sure all elements of the picture are in the sharpest possible focus, then shoot with the lens stopped way down.

The film used in taking these table tops was Eastman's Royal Pan (ASA, 160-200) and Verichrome Pan. All exposures were determined by a Weston light meter. Typical exposures, using one 500-watt spotlight and a 150-watt spot with Royal Pan film were as follows:

Mountain	**half-second at f-32**
Earth	**seven seconds at f-8**
Stars	**15 seconds at f-8**
Exhaust flame	**three seconds at f-8**
Rocket	**one second at f-8**

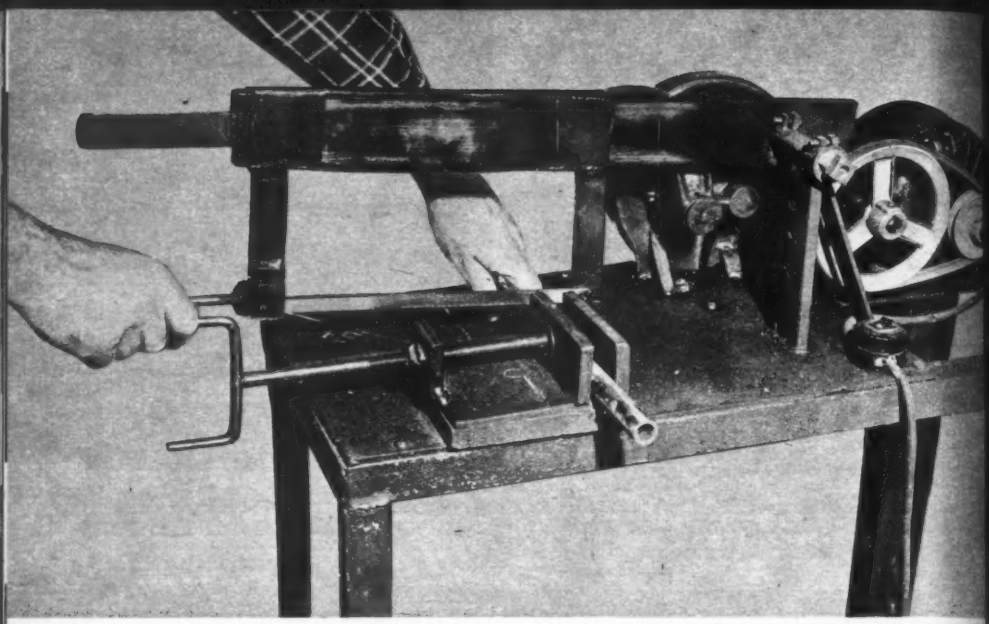
All these exposures should be doubled for Verichrome Pan film. The exposure for your table top may be longer or shorter, depending on the amount of light illuminating the scene. To be on the safe side it is always a good idea to take at least three shots before dismantling the set. One exposure should be on the "under" side and another should be on the "over" side. •

LIFELIKE model spacemen are positioned around their spaceship on "moon's" surface.



ANY ROCKET CAN PLAY! Here a Jupiter C model rests at its gantry prior to firing.

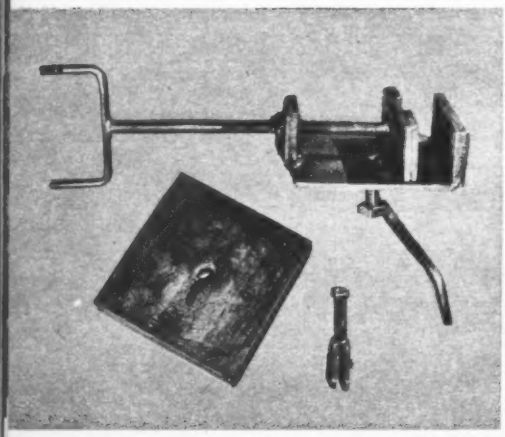
MODEL SPACESHIP of the future is positioned before photograph of moon preparatory to shooting the picture.



MOTOR-DRIVEN HACK SAW

Cut through metal in minutes with a power saw which you can build for less than ten dollars.

By Richard Hanson

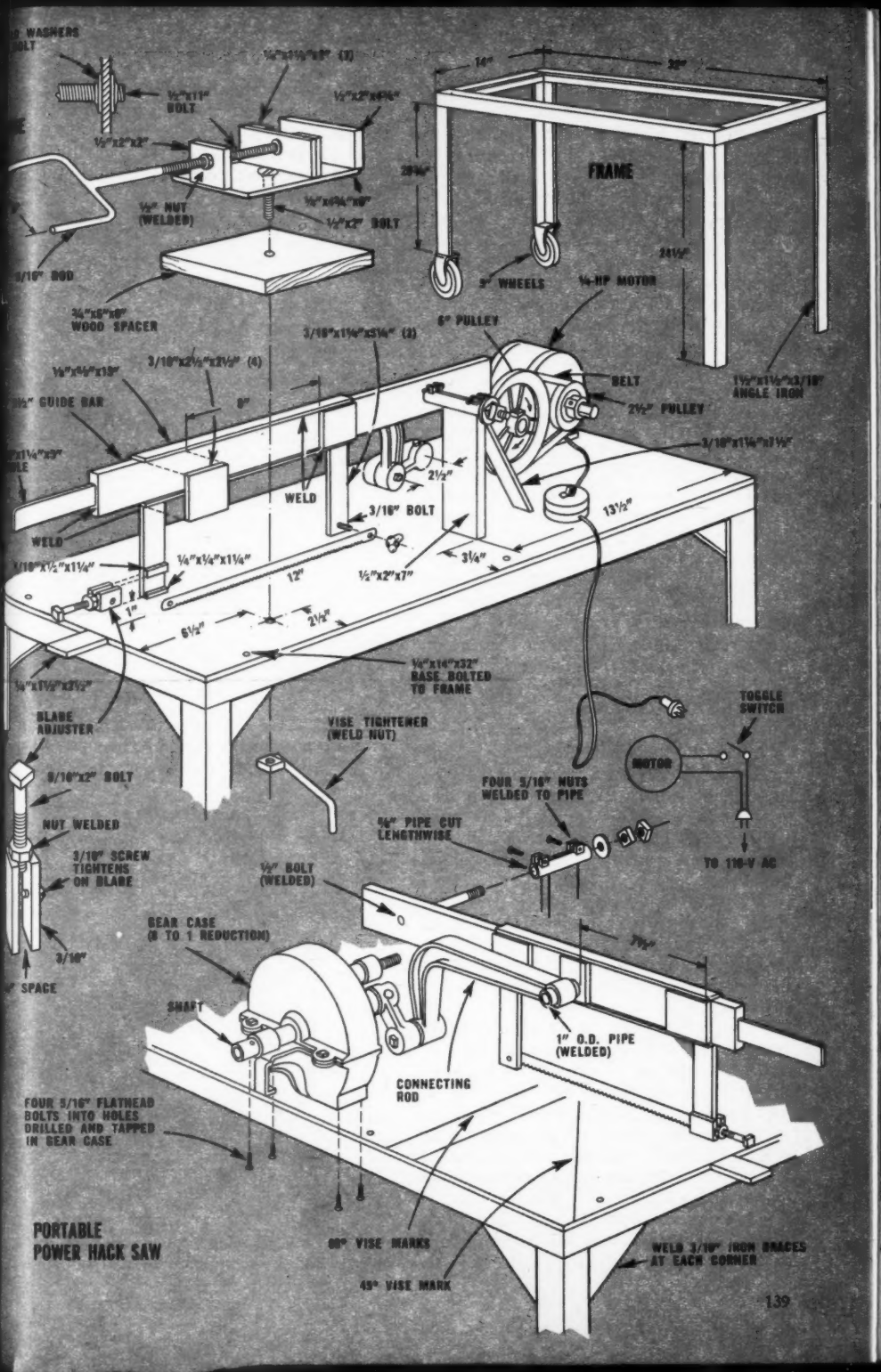


VISE consists of bolts, sheet iron and rods. Spacer and blade adjuster are below it.

CUTTING metal by hand is a chore nobody likes and it's a chore you can forget if you build this power hack saw. Ideal for the home workshop or farm, it can be built for less than ten dollars from readily obtainable parts.

The oscillating or sawing action is provided by an old washing machine gear mechanism which can be picked up at a repair shop or junk yard. There may be variations in gear mechanisms but many of them will serve the purpose. The one used here has an eight-to-one gear ratio and operates the saw at about 60 strokes per minute.

To begin, you'll need a flat piece of quarter-inch iron for the base. This base is then bolted to a frame made by welding angle iron together. Two legs of the frame (or stand) are equipped with five-inch, heavy-duty casters to make it


WASHERS
BOLT
½"x11" BOLT
½"x2"x2"
½" NUT (WELDED)
3/16" ROD
¾"x8"x8" WOOD SPACER
½"x2"x4¾"
½"x4¾"x8"
½"x2" BOLT
14"
28"
FRAME
28¾"
24½"
5" WHEELS
¼-HP MOTOR
6" PULLEY
3/16"x1¼"x3¼" (2)
3/16"x2½"x2½" (4)
⅛"x⅝"x13"
½" GUIDE BAR
8"
BELT
2½" PULLEY
1½"x1½"x3/16" ANGLE IRON
3/16"x1¼"x1½"
2½"
WELD
3/16" BOLT
13½"
WELD
¼"x¼"x1¼"
12"
½"x2"x7"
3¼"
1"
6½"
2½"
¼"x14"x32" BASE BOLTED TO FRAME
¼"x1½"x2½"
BLADE ADJUSTER
VISE TIGHTENER (WELD NUT)
TOGGLE SWITCH
MOTOR
5/16"x2" BOLT
NUT WELDED
3/16" SCREW TIGHTENS ON BLADE
FOUR 5/16" NUTS WELDED TO PIPE
⅝" PIPE CUT LENGTHWISE
TO 110-V AC
½" BOLT (WELDED)
GEAR CASE (8 TO 1 REDUCTION)
3/16"
SPACE
SHAFT
1" O.D. PIPE (WELDED)
CONNECTING ROD
FOUR 5/16" FLATHEAD BOLTS INTO HOLES DRILLED AND TAPPED IN GEAR CASE
PORTABLE POWER HACK SAW
60° VISE MARKS
45° VISE MARK
WELD 3/16" IRON BRACES AT EACH CORNER

mobile. When the stand is ready, the gear mechanism is fastened to the base in a position where it will accommodate the rest of the saw and the quarter-horsepower motor.

After obtaining a heavy iron guide bar for the saw frame to ride on, cut the pieces for the saw frame and lay them in position over the guide bar for welding. Then place a thin metal shim under the pieces, complete the welds and remove the shim immediately. Without a shim, the contracting welds would make the saw frame too tight to ride on the bar.

The next job is to drill a hole through the guide bar for a bolt and make the bearing for the bolt. This pipe bearing has a slot the full length with nuts welded on top so that it can be made absolutely tight on the bolt, preventing side sway of the saw blade. The pieces for the bearing support are cut and welded together to place the bearing at a height which will bring the saw blade about one inch above the base at the end nearest the bearing.

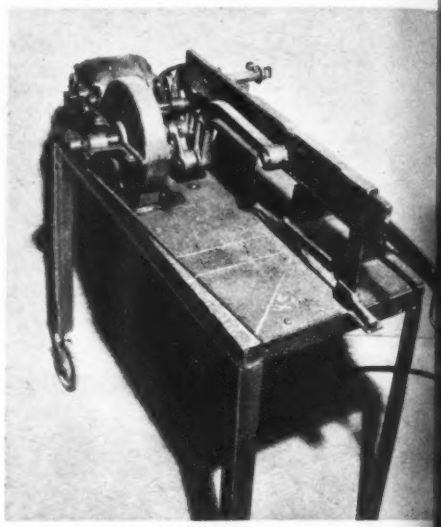
With the guide bar and saw frame on the bearing, locate the connecting rod so that the saw moves properly and then weld the rod to the saw frame. Then the bearing support can be welded to base.

When the motor is mounted and the toggle switch is wired in, install the pulleys. Then check the front end of the saw frame to see that it rides on the base for the full length of its stroke; if not, weld a short flat iron extension to the base.

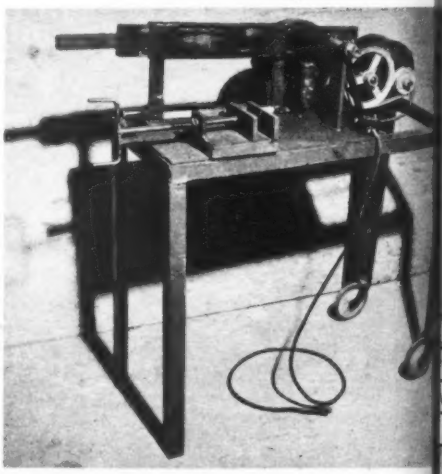
The saw blade adjuster is made up next. Then a 12-inch blade is inserted and the tension is increased by turning the bolt in at the end. Make sure the blade travels straight and at right angles to the table.

Finally, the vise is made as illustrated. If large pieces are to be cut, make the upright pieces higher than indicated. Locate the hole in the base so that the vise can be turned at any angle without interfering with the saw blade. Also locate it so that any piece to be cut is as close to the inner end of the blade as possible.

For quick alignment of the vise, mark the base with 45° and 90° lines. Before sawing, tighten the vise securely with the handle beneath the base and then clamp down on the piece. When you throw that switch, your metal cutting will be just a matter of lowering the blade—no more cramped fingers and a weary arm. •



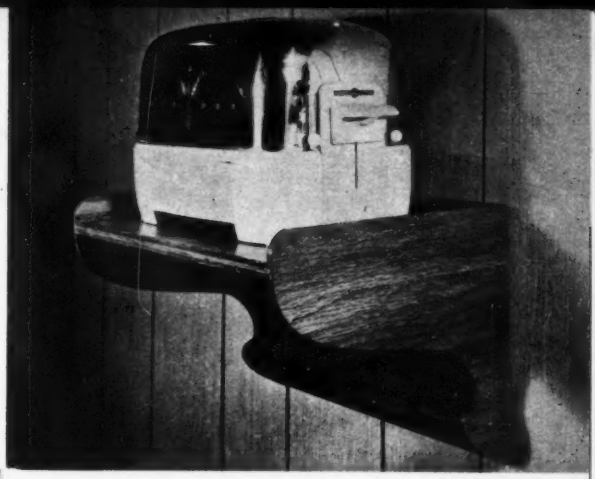
CONNECTING ROD is welded to the saw frame which slides on a heavy guide bar.



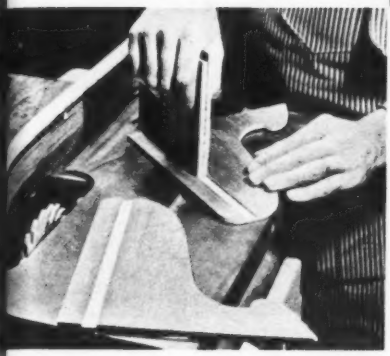
VIEW of right side shows vise location. Blade has a cutting stroke of five inches.

EVENING PROJECT

Appliance Shelf

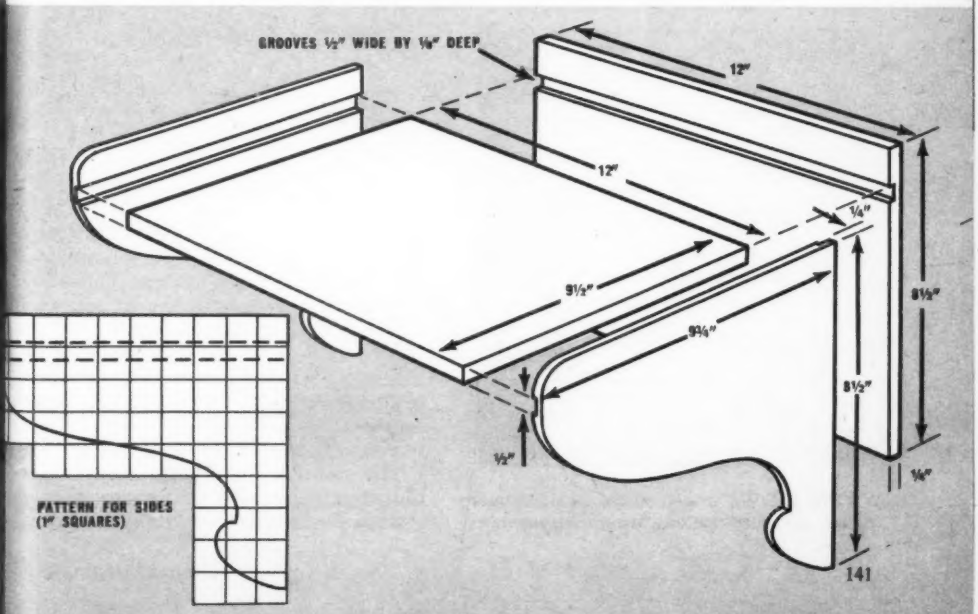


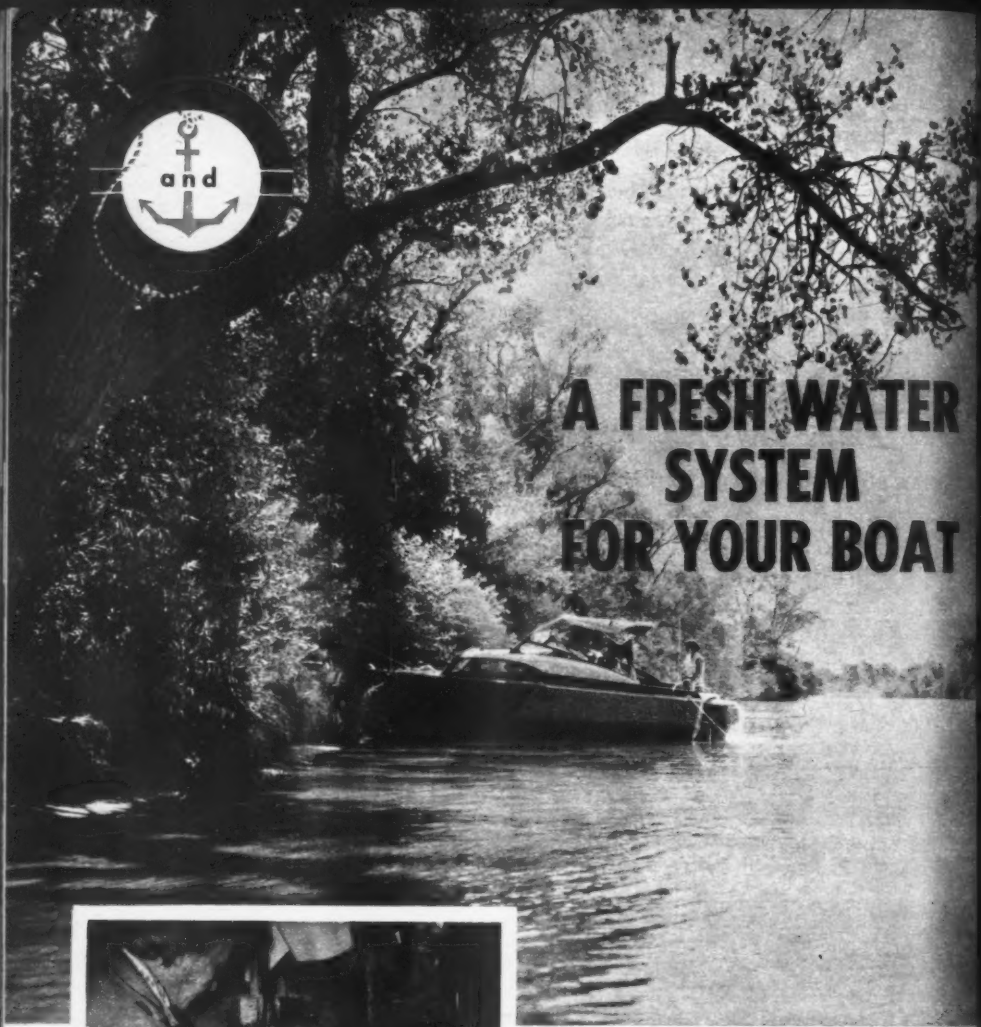
SCRAP WOOD left over from wall paneling job was used to make this shelf. You can alter the pattern shown for the sides to suit yourself.



TWO ¼-inch plywood pieces form shelf; check dado fit before gluing.

HERE'S a handy household holder any fellow can knock together in two shakes of a shop apron. Made entirely of quarter-inch plywood cut to the dimensions shown in the diagram and finished to suit, the shelf is designed to hold your toaster, radio, telephone or favorite knickknacks. Apply a couple coats of varnish to bring out the natural grain of the plywood. If you like, the piece can be brightened by hanging colorful pot holders from cup hooks screwed into the bottom of the shelf. •





A FRESH WATER SYSTEM FOR YOUR BOAT

WATER FLOWS freely at the sink because of air pressure in the ten-gallon system.

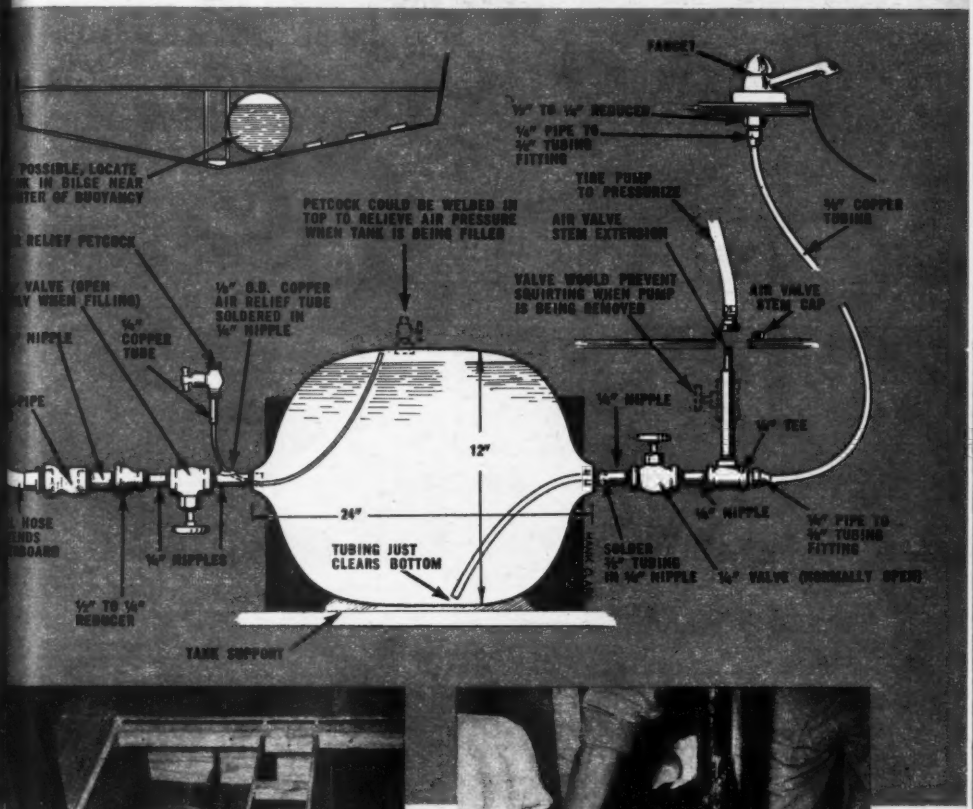
By Keith F. Hildebrand

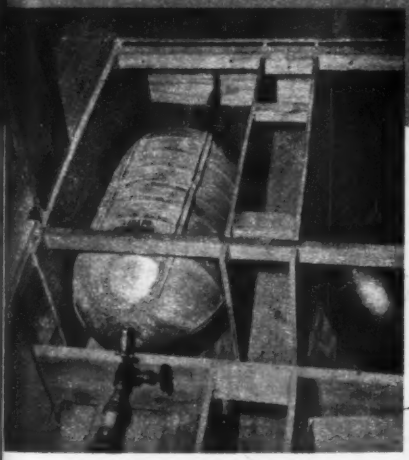
TURN on the faucet and the fresh water flows. That's what you have with this pressurized system. There's no pumping at the sink and no gravity-feed tank to hang high on a bulkhead. The weight is low in the hull where it belongs and where there are more places to locate a tank. Ideal for outboard cruisers, the system has been in use two years on our own 21-footer.

The stainless steel tank is a war surplus item still available in many surplus stores. Designed to contain breathing

oxygen, it has quarter-inch pipe threads at each end and holds about ten gallons of water. Ours, used but clean, cost $7.50.

Installation is quite simple as can be seen from the illustrations. The only tricky part is the air relief tube which is necessary if the tank is to be filled to capacity. A straight- [*Continued on page* 176]





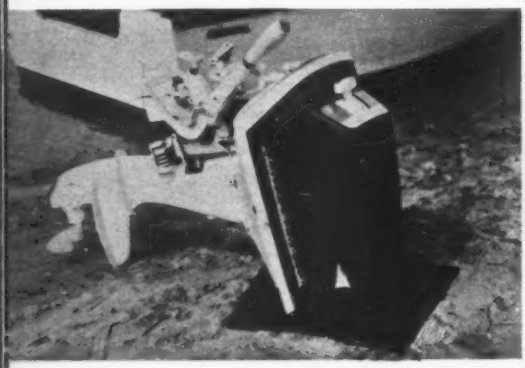
VIEW from intake end of tank shows hose connection, valve and air relief petcock.

TIRE PUMP is attached to air valve stem to pressurize system. It isn't used often.

5 NAUTICAL USES FOR RUBBER MATTING

FUEL TANK doesn't mar hull if mat is placed beneath it; use synthetic rubber.

ANCHOR and chain won't rattle and bang in a fast boat if they're laid on a mat.

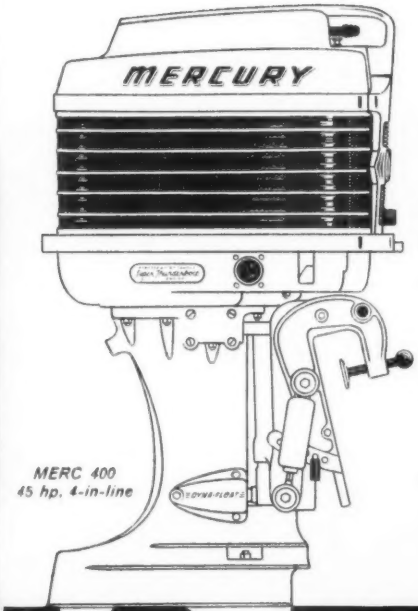


ON THE BEACH, mat prevents sand from getting into the mechanism of the motor.

CUTTING BAIT on the mat lessens the mess and prevents knife scars on a seat.

DURING REPAIRS, small parts stay on mat, don't roll off to get lost or dirty.

MERCURY is the world's No. 1 outboard in Reliability!



MERC 400
45 hp. 4-in-line

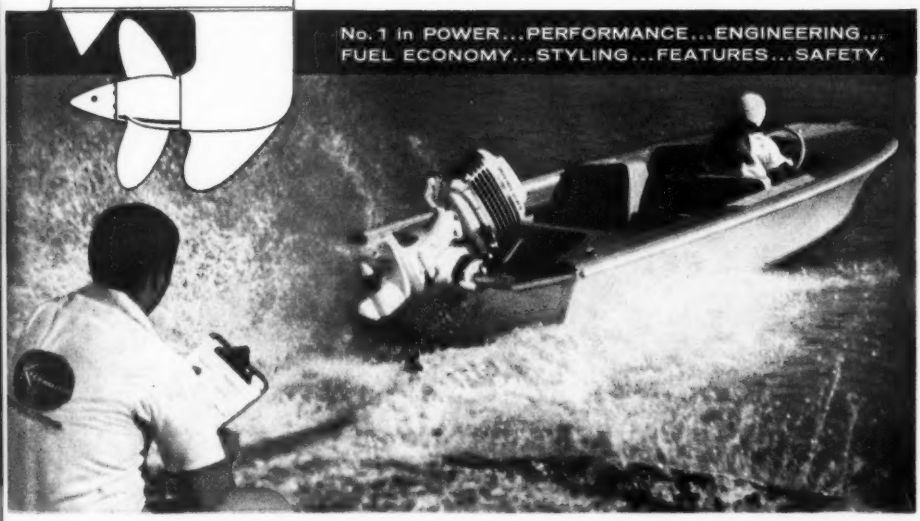
Reliability is a built-in bonus you get in every Mercury — reliability proved in Mercury's world record 50,000 mile endurance run and Mercury's 107.9 mph world record. Mercurys outrun and outlast all other outboards because Mercurys are safety-engineered to thrive under treatment far rougher than you will meet in normal boating use!

Because of such Mercury features as exclusive Hydraulic Dyna-Shock Absorbers and Safety-Tilt Switch, forged aluminum clamp brackets, "Flo-Torq" Safety Clutch, and one-piece "Uni-Cast" gear housing, this Merc 400 can slam over a log time after time without damage to the motor, as demonstrated in the proving ground test below.

See your dealer for a demonstration of these and other features which make Mercury the World's No. 1 Outboard! Nine new models, 6 to 80 hp, in twins, fours and sixes.

Write for free catalog.

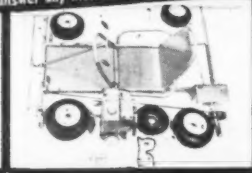
© 1960 Kiekhaefer Corporation, Fond du Lac, Wisconsin



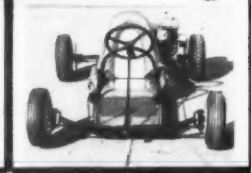
KART AND SPEED EQUIPMENT HEADQUARTERS

features the East's finest selection of equipment and accessories. Staff experts are ready to answer any installation or parts questions.

CALSPEED KART FRAME
Welded frame of 1" steel tubing, comes with 5/8" or 3/4" axels. Needs only motor, wheel assemblies, engine, sprocket and chain to complete. — $49.95



CALSPEED KART KIT
Complete kit as shown, with all parts and fittings necessary to assemble. — $139.95



GO KART WELDED KIT
The original GO KART model No. 400C welded kit. Upholstery extra. — $148.25

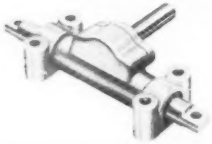
MOSS 1/4 MIDGET (shown) $56
MOSS 1/2 MIDGET $59
Other midgets from $449 and up including such names as Racecraft, Wahlborg, Kurtis, Offyette etc.

CRATED AND SHIPPED ANYWHERE IN THE U.S.A. — FOR $10.00

ACCESSORIES FOR THE KARTING ENTHUSIAST

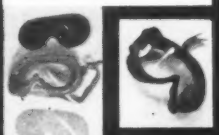
WHEEL ASSEMBLY
5" wheel, 10" diameter, complete with tire and tube, 5/8" or 3/4" roller bearing No. WAS21. $10.95
Plus shipping costs.

WHEEL ASSEMBLY
5" wheel, 11" diameter complete with tire and tube, 4 1/4" offset hub. No. WAS22 — $14.95
Plus shipping costs.



CALSPEED ROUND RACK AND PINION
Cast aluminum body, steel snub shaft, easy mount pads rotate 360°, 2" travel on rack 5/8" dia. round rack and flat for 1/2" clevis or ball joint. — $14.95
Plus shipping costs.

MOON WHEEL DISCS
Spun aluminum for 4", 5" and 6" diameter wheels, with mounting screws — set of 4 — $4.95
Plus shipping costs.

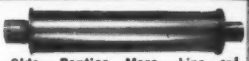


PROFESSIONAL GOGGLES
Anderson 1/4 midget with 2 lenses — $3.25
American Optical racing goggles used by world's leading race drivers. $3.95
Add 50c for shipping.

ROMER SAFETY HELMET
White glass fibre with leather covered foam rubber front bumper, inside protective harness, goggle strap, etc.
No. HR9W — $14.75
Plus shipping costs.

RACING GLOVES
Makes driving easier, less tiring and safer. Ventilated backs for coolness. Neutral and black colors.
Adult $7.95
Children $6.95
Add 35c for shipping.

SPEED EQUIPMENT

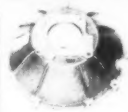


GLASS PAC MUFFLER
The finest glass-lined muffler with a deep, deep bass tone that makes your car sound like a powerhouse. For all Fords, Chevys., Cad., Dodge, Olds., Pontiac, Merc., Linc. and Studebakers. — $5.95
State car, year, Auto or std. trans.

CAL SPEED, CUSTOM FITTED, FLOOR SHIFT CONVERSION KIT
Spring-Loaded, H-pattern, no-miss shifting — install in one hour at home — guaranteed for the life of your car. Ford '49-'59 small transmission, standard, and overdrive. Chevy '49-'60 standard and overdrive. Cadillac-LaSalle side shift. Olds 1950 — $39.95
State car, year and model.

ADAPTORS

#301 ADAPTOR
32-48 Ford and Merc. Transmission. 49-50 Merc. Transmission. 32-51 1/2 to 1 1/2 ton Ford Truck. — To — 49-58 Olds Engine. 49-54 Cadillac Engine. Complete with pilot bushing. $16.95



#101 ADAPTOR
Adapt any V-8 Chevy Engine 1955 to 1958 to any 6 Cylinder Chevy Passenger Car Transmission from 1940 to 1954. $37.95

#307 ADAPTOR
55-59 OHV Chevrolet V-8 Engine To Early Ford Transmission with pilot bushing. $29.95

#600 ADAPTOR
54-57 OHV Ford and Merc. Engine Early Ford Transmissions. Complete $35.

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306 Jersey Avenue, New Brunswick, N. J.

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NAME _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____
MY CAR IS _____ YEAR _____ MODEL _____

Quan.	Description	Price

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NO C.O.D. on any order less than $5.00.
SEND FOR KART & MIDGET CATALOG MM160 ..... ($1.00)
SEND FOR SPEED EQUIPMENT BROCHURES ..... ($1.00)

WENOKA PARK CAMPS
for Boys and Girls from 6 to 16 years.
Send for illustrated brochure.
P.O. Box 100 — Johnsonburg, N. J.

CALIFORNIA SPEED AND SPORT
306 JERSEY AVENUE, NEW BRUNSWICK, N

FUN IN SCIENCE

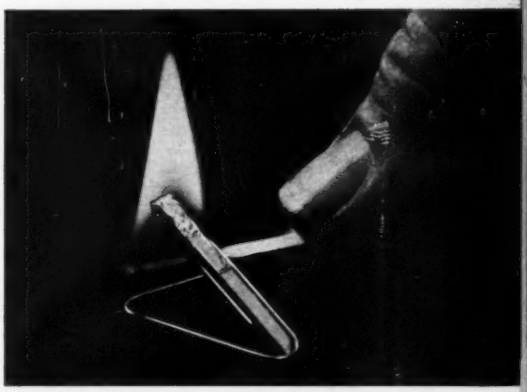
YOU CAN perform this Jet-Age "parlor" trick for less than a penny's worth of materials. Besides being amusing, the experiment also demonstrates the basic principle of jet propulsion. However, because of a possible fire hazard, do your Cape Canaveraling in the yard—not in the house. Included in this gimmick are a launching pad (of sorts), a genuine count-down and the (subdued) roar of a blast-off.

Here's how it's done: fold a little 1x2-inch strip of aluminum foil over the head-half of a paper match, fold down, then fold it tightly around the match.

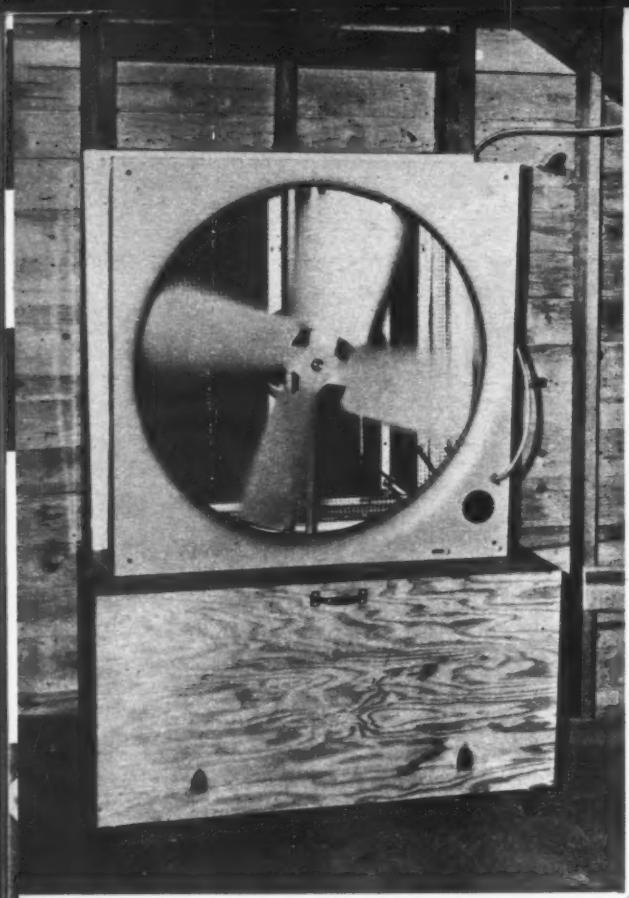
Now place the "missile" head-up on a paper clip launcher, hold a flame under the foil-covered head and start the count-down. In about five seconds a blast of hot gas from the exploded tip of the enclosed match will *pffft* from the end of your missile and arc it up and across the yard with remarkable speed. For a higher trajectory, elevate the launcher; but if it's distance you're after the angle of the launcher must be decreased.

You can get some idea of the speed of flight from the photo at the head of the page which was taken with electronic speedlight illumination. The flash duration of 1/1200 of a second wasn't fast enough to freeze the motion of the match!—*R. J. Capotosto*

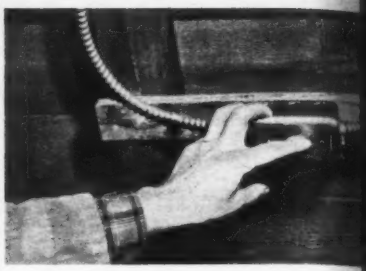
TO CHANNEL out the jet blast, wrap foil tightly around match, then bend down top.



COUNT-DOWN starts when flame is applied to the missile on its paper clip launcher.



FAN IN OPERATION. It can be rolled away when not in use to avoid obstructing window.



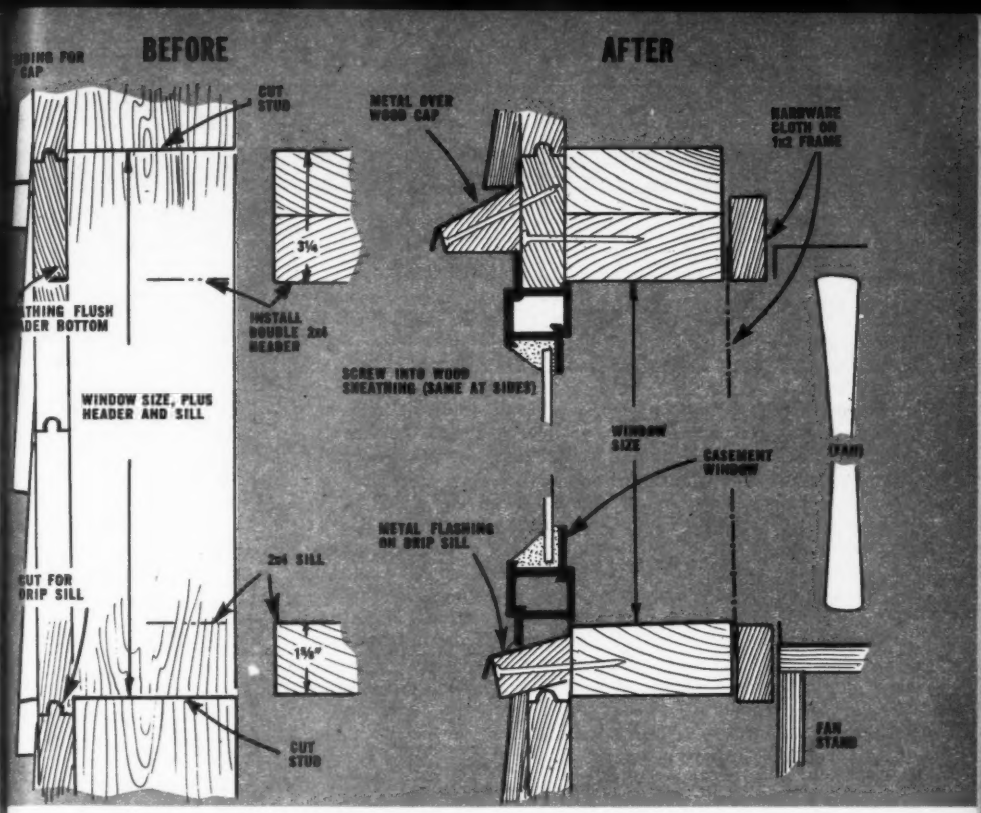
AN EXTRA SWITCH, in series with the line, is added safety factor.

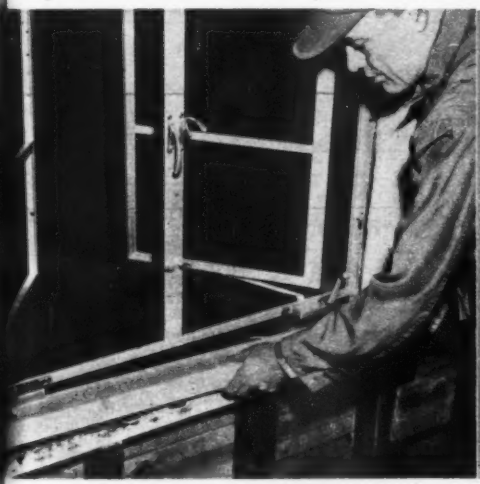
MOBILE ATTIC FAN

SHEET ALUMINUM is used as flashing before installing casement window.

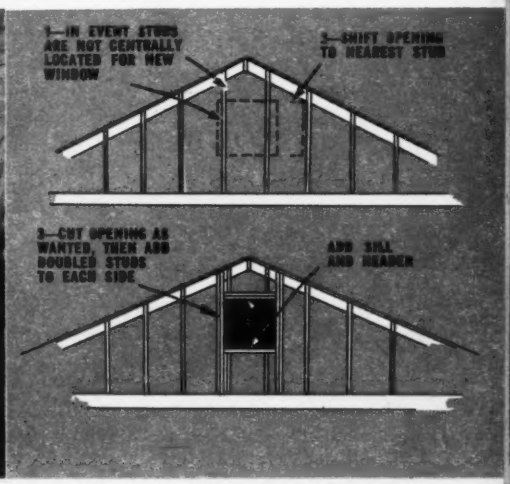
AN attic fan is the next best thing to air conditioning during the summer months. However, there are several drawbacks to the usual louver-fan combination. First, if the fan is located in the only window in the attic, the louver blocks off the light during the greater part of the year when the fan is not used. This is especially annoying if you make frequent trips to the attic for storage purposes. Secondly, most louvers are not completely watertight, which means that during a driving rain storm, and especially if your fan is located on the "weather" side of the house, rain and cold air will penetrate the louver with possible damage to walls and ceiling.

The solution is a casement window in front of the fan [*Continued on page* 178]





WINDOW SILL installed over flashing should have a slight taper to shed rain and snow.



HOW TO CUT an opening in your attic if you do not have an existing window.

New Ideas in Photography fr

Drama for 8mm Movies! New Kodak Movie Camera Zooms Scenes In or Away

Now you can give your home movies the same dramatic zoom effects you see in theater movies or on your TV screen. Catch your subject in motion—then zoom in for a close-up without interrupting the action or changing your position!

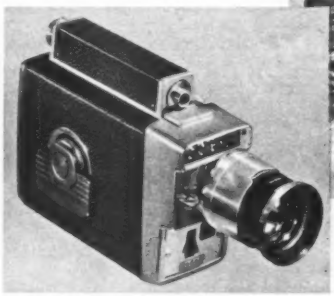
The remarkable new Kodak Zoom 8 Camera (Automatic *f*/1.9) features a variable focal length lens. As you slide the lens barrel forward or back, it seems to "shrink" or "stretch" the distance to your subject.

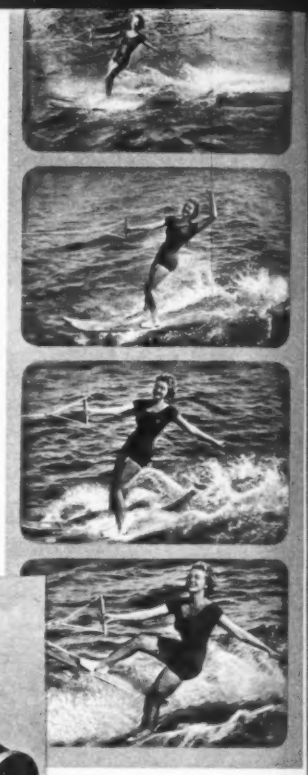
In shooting sports scenes, for example, you can get an over-all view of the action, then zoom in on one player. When you project the scene, the player comes closer and closer, growing bigger on your screen.

You can also use the Zoom 8 lens to get the same wide-angle, regular, or telephoto effects that used to require a 3-lens turret camera. Each field is outlined in the telescopic viewfinder.

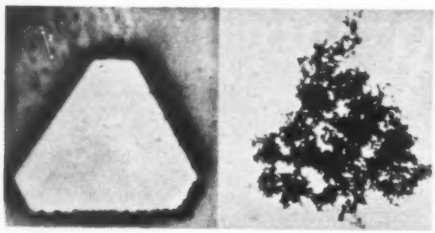
Another great feature: built-in electric eye adjusts the fast *f*/1.9 lens automatically for correct exposure. And the viewfinder eyepiece adjusts for your own eye.

Enjoy a new kind of action-packed movies with the Kodak Zoom 8. An unusual value at only $139.50, or as little as $14 down. Many dealers will take your old camera in trade.





Kodak Zoom 8 Camera brings faraway subjects up close without stopping the action.



Enormously magnified crystal of silver bromide (left) in 10,000-volt-per-centimeter field. It is just starting to develop; note tiny metallic silver specks along bottom. At right, fully developed silver network. Photos are of electron-microscope images.

Film Now Investigates Film, World's Most Sensitive "Amplifier"

Scientists are now using photography itself—and the electron microscope—to learn more about the inner behavior of photographic film.

They have found that when photons, the "energy bullets" of light, strike the silver halides in film, electrons are liberated. These electrons, in turn, trigger a development reaction a billion times as great as the photons' original power!

Such advanced research into the physics of film emulsions gives Kodak new knowledge to create faster, finer grained films for amateur and professional use.

phy from Kodak

Screen Arrow Adds Showmanship to Automatic Slide Shows

Now when you show slides to guests you can point out details on your screen without leaving your chair for even a moment.

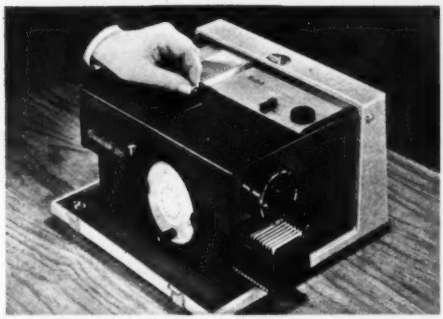
Lift a finger-tip control on your automatic Kodak Cavalcade Projector—and a shadow arrow appears on the screen. Up, down, right, left—the arrow moves as you choose, to point out details you want to discuss.

And all the time, your Cavalcade is changing slides automatically at the pace you chose—as many as 40 slides in sequence. Instant change between slides, too—no long drag or dark screen!

Controls let you hold, repeat, or skip any slide—or lift out any slide with a finger-tip ejector. And each slide is held in its own steel protector, for smooth showing, no jamming.

Take some slides along when you ask your dealer to demonstrate this wonderful projector. With *f*/3.5 lens, only $124.50, or $12.50 down.

Arrow points out details as you talk about them.



Control for arrow is easy to reach, easy to use.

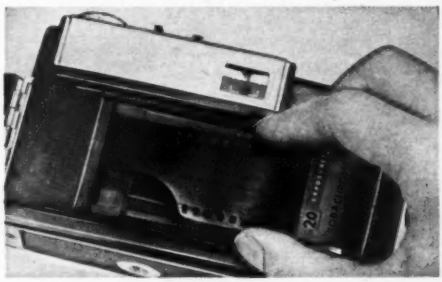
Ingenious Film Loading System Does Away With Take-up Spool

Here's the quickest, simplest 35mm film loading ever devised. No threading or hooking on a take-up spool. *There isn't any spool.*

With the Kodak Signet 80 Camera, you just drop the film in, start the tip into a slot, and close the camera back. As you advance the film, it feeds smoothly into an expansion chamber.

Such ease of operation is typical of the Signet 80. Exposure control is easy—the built-in light meter ends guesswork. Focusing is easy, rangefinder couples to all lenses. Film advance is easy—two thumb-flicks!

This is truly the camera with the skill built in. See for yourself. With 50mm *f*/2.8 lens, only $129.50, or as little as $13 down.



Loading so easy you can do it blindfolded!

Prices are list, include Federal Tax, and are subject to change without notice.

35mm wide-angle lens for Signet 80, $57.50; 90mm telephoto lens, $69.50; multi-frame finder, $17.50. Other aids available for ultra close-ups, sports, even photomicrography.

EASTMAN KODAK COMPANY, Rochester 4, N. Y.

Kodak
TRADEMARK

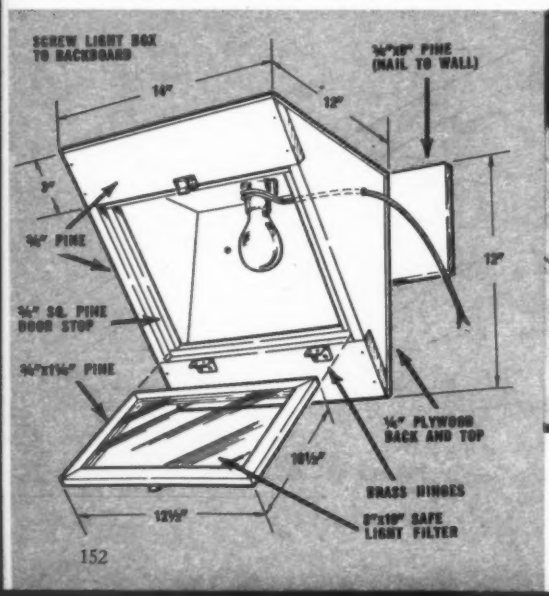
SEE KODAK'S "THE ED SULLIVAN SHOW" AND "OZZIE AND HARRIET."

TWO of the triangular safelight boxes serve as strong supports for a darkroom shelf.

BUILT-IN SAFELIGHT

IDEAL for a permanent darkroom, this safelight box has a hinged door which is recessed so that a filter may be changed merely by lifting it out. Two or three boxes can be made, depending upon the length of the workbench and sink. Their triangular shape also makes them excellent supports for a shelf which will hold a large supply of chemicals and papers.

If more than one box is made, wire the receptacles together in parallel so that all the bulbs can be controlled by a single switch.—*Don Shiner*



BOX is screwed to pine backboard. The bulb shouldn't exceed 25 watts.

Weight-saving, welded construction helps the Falcon go up to 30 miles on a gallon of gas.

Why does the Falcon have a welded single-unit body and bolted-on front fenders?

Welded, single-unit construction gives more usable space, great strength, an unusually quiet ride. That means the Falcon can be compact outside and yet carry six big people in comfort. And this *lightweight* method is one big reason why the Falcon goes up to 30 miles a gallon.

Bolted-on front fenders cost less to replace. In fact, just about half what welded-on fenders cost. They speed repair jobs, too, to save you time *and* money! That makes them *right* for an economy car.

It's the same with Falcon's single carburetor that costs half what a dual system costs to replace. And it's much easier to adjust since it does not require synchronizing with a twin.

But a *true* economy car must have fine-car quality to keep resale value high. And that's where the Falcon shines brightest!

Try these simple quality tests. *Push* your hand against the Falcon's "ceiling." You'll find a deep layer of sound-conditioning material. *Feel* the texture of that beautiful upholstery. *Inspect* the workmanship of each bright metal detail. That's quality you can see and feel.

Economy where it pays... quality where it counts! That's the Falcon... easiest car in the world to own.

THE 1960 FORD **Falcon**

FORD DIVISION, *Ford Motor Company*

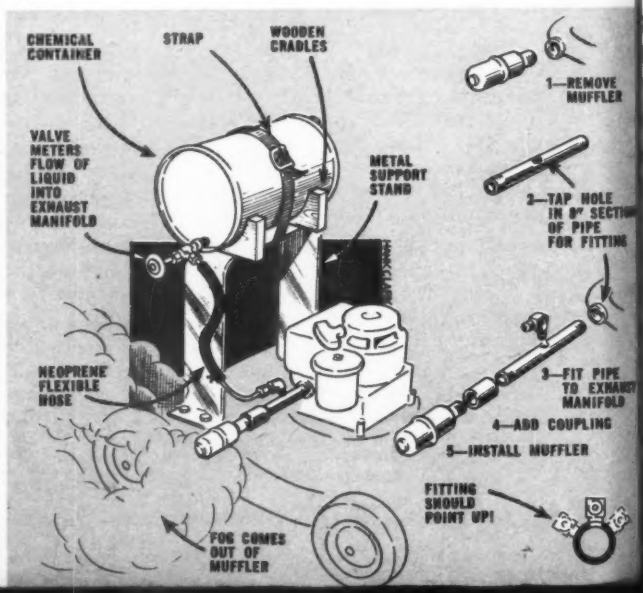
BUG KILLER

MIXTURE is 94% Deisel oil, 3% Malathion and 3% Lethane 384.

Mosquitoes won't attend your next lawn party if you fog the yard beforehand with insecticides.

ANY lawn mower using an internal combustion engine can double as a pest-control machine by laying down a bug-killing fog of insecticide. Simply run a length of pipe between muffler and motor and allow the insecticide to drip into it via a tube connecting the pipe with a small tank installed on the mower. The hot pipe then burns off the insecticide as a fog.—*Hal Kelly*

BUG BOMBARDIER opens the insecticide feed line just before heading out on Operation Skeeter-Kill.



NEW! FROM DU PONT

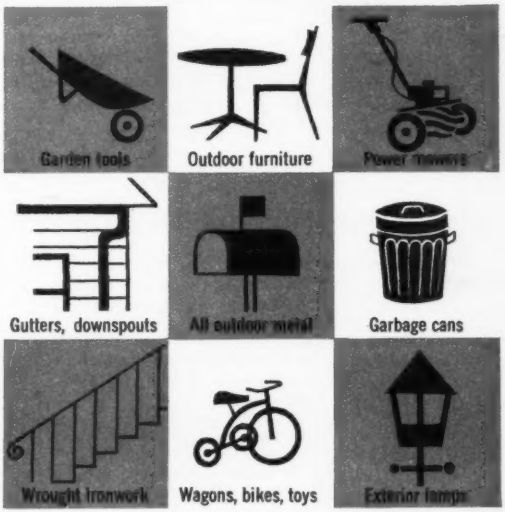
DUCO

REG. U. S. PAT. OFF.

ANTI-RUST PAINTS

stop rust...for all metals, new or old

Another contribution from Du Pont Research! Anti-Rust Paints for every surface. "Duco" Anti-Rust Primers for damp-proof priming of rusted metal; for clean steel, tin and aluminum; for all galvanized and copper surfaces! "Duco" Wrought Iron Black for exterior or interior use. "Duco" Chrome Finish Aluminum Paint. And for colored top coats doubly durable Du Pont "Duco" Enamel. These new Anti-Rust Paints . . . today's best protection for metal, indoors and out . . . are all at your Du Pont dealer's—now.



Buy the paint that's worth the work—the beauty lasts

DU PONT

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

Watchmaker's Precision

plus a

BULL-DOG GRIP

Specially Designed

CHANNEL LOCK®

No. 718 Long-reach

Flat-Nose Plier

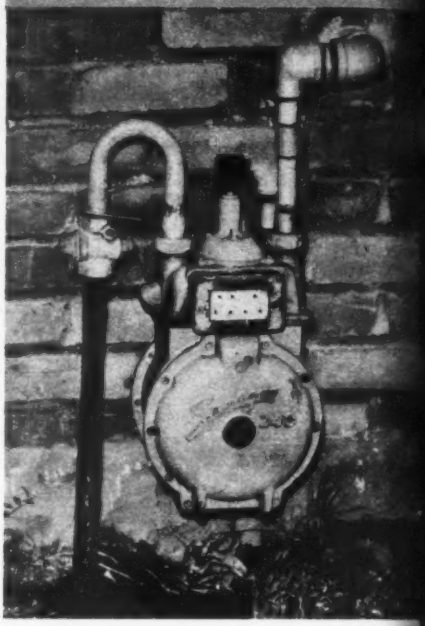
Looking for a precision plier that really takes hold in hard-to-reach places? Here's your answer . . . this specially designed CHANNELLOCK Flat-Nose Plier. Just the ticket for electrical, radio, TV, Hi-Fi and other electronics work. Micro-matched, scored, long, flat jaws. Comfortable, blue-plastic grips. Top quality, polished forged steel. Ask your tool supplier for a CHANNELLOCK No. 718 Flat-Nose Plier. If he's out of them, ask him to order one for you.

Write for Catalog of Complete Line of Pliers

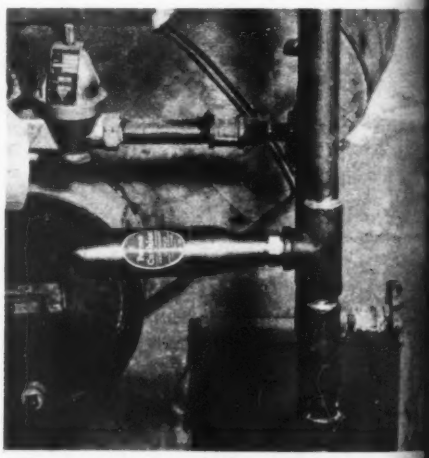
CHAMPION DEARMENT TOOL COMPANY

Meadville 3, Pennsylvania

WHAT'S NEW?



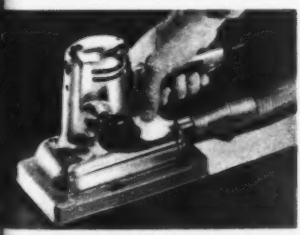
NEW TYPE of gas meter being installed b the Long Island Lighting Company is locat on the exterior of the house instead of cellar. No more rumpus room interferenc



WATER HAMMER eliminator can be mount into any convenient "tee." Stops pipes fro clanging. Neoprene expansion chamber enclosed inside a threaded brass cylinde

General Fittings Co., East Greenwich, R. I.

¼" Deluxe Utility Drill. *More* power for ling and driving attachments. Compact sing—fits your hand like a glove! B&D ls from $16.95. Attachments at $14.95.



's Dustless Finishing Sander is so *dustless* t can sand and paint side by side! Long on ver—light on weight. Attach to any uum cleaner. B&D Sanders from $29.95.

ASK THE EXPERTS!

Men who work on America's top construction jobs work with America's top saws—built by Black & Decker!

That same tough dependability, prized on big construction jobs, makes a Black & Decker Saw *your* best choice —whether you use it on the job or around your home.

There's extra built-in power, speed, accuracy and ease of handling for *more work with less maintenance*. Ask the experts, they'll tell you to put your money on B&D! Choose from five great models—from 6½" to 9¼" blade diameter. Priced from $49.95. For free power tool catalog, write: THE BLACK & DECKER MFG. Co., Dept. F-040, Towson 4, Maryland.

50th YEAR

See "Tools-Electric" "Yellow Pages" for Service & Sales

WORLD'S LARGEST MAKER OF PORTABLE ELECTRIC TOOLS

Black & Decker®

SEPTIC TANK PERCOLATION TEST

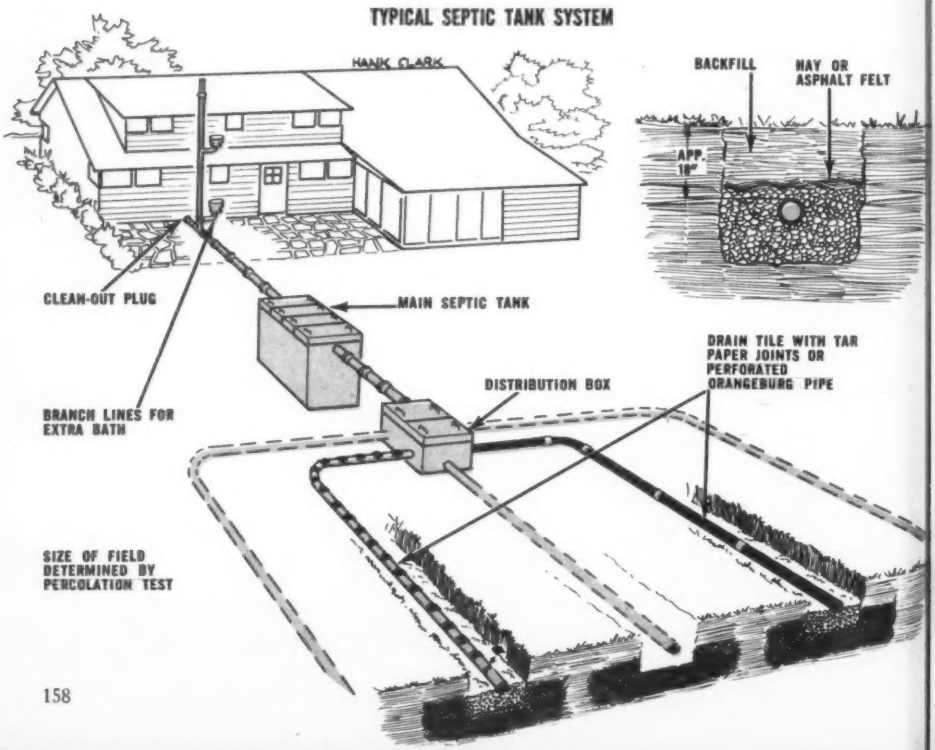
Can you install a practical septic tank system on your home site? This simple test will tell you.

By Kirk Polking

PLANNING to build or buy a home in an area where the septic tank waste disposal system is used? If so, you may save yourself money and aggravation later by making a simple test on the site now. Many owners who failed to take the precaution of checking the absorption qualities of their soil have had the unpleasant problem of sewage backing up into their frontyards.

The percolation test devised by the Robert A. Taft Sanitary Engineering Center of the U. S. Public Health Service requires only a few materials: a posthole digger, a small amount of gravel, a yardstick, a board, a watch and a supply of water. To make the test, only a few simple preparatory steps are required: (1) Dig or bore a hole four to eight inches in diameter and two-and-a-half to three feet deep; (2) Scratch the sides and bottom of the hole with a knife to roughen the surface; (3) Remove all loose soil from the hole;

TYPICAL SEPTIC TANK SYSTEM



(4) Add two inches of fine gravel to the bottom of the hole.

When the hole is ready, the soil must be fully *saturated* and *swelled* before the test can be conducted. Soils are considered *saturated* when the water stands between the soil particles; they are considered *swelled* when the water has soaked into the individual soil particles and caused them to meld together. This is accomplished quickly in a sandy type of soil but the process is slow in a clay type and should be allowed to take place overnight. When it is accomplished, it simulates the condition the soil will be in during the wettest season of the year.

To make sure the soil is thoroughly soaked, you should maintain a minimum depth of 12 inches of water in the hole for at least four hours before allowing it to soak and swell overnight. In some soils, it may be necessary to add water only every hour or so; extremely sandy soils will require filling more often.

If it is inconvenient to remain at the site for over a four-hour period, you can let a jug do the work for you. As illustrated in one of the drawings, it will act as a siphon to keep water in the hole. Get a five-gallon distilled water jug from a drug store or use a five-gallon gas can from a filling station. Make a plug for the neck of the jug from a cork or a rubber stopper, inserting two pieces of copper tubing, one to let air into the jug and one to let water run into the hole. If a gas can is used, the copper tubes can be soldered into holes punched in the screw-type cap. The hole should be filled with clear water to a minimum depth of 12 inches over the gravel. Then the jug or can is filled with water and turned upside down over the hole to let the water drip out and maintain the depth of 12 inches. You can leave it this way to soak overnight before going back to make the percolation test.

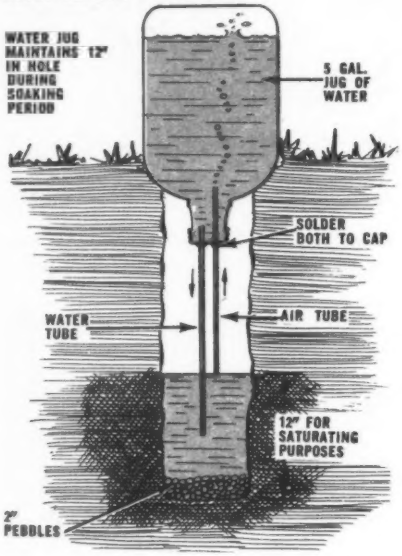
The next day, adjust the water level in the hole to a depth of six inches, either removing water if it is still standing or adding it if the hole is empty. Then measure the drop in water level at approximately 30-minute intervals for four hours, refilling to a level of six

POSTHOLE DIGGER is used to make a hole of at least 4-inch dia. and 2½-foot depth.

WATER is kept in hole overnight since soil must be thoroughly soaked for test.

TEST is measurement of minutes it takes water to fall 1 inch when soil is soaked.

CROSS SECTION OF TEST HOLE



inches as necessary. From the drop that occurs in the final 30-minute period, calculate the number of minutes it would take for the water level to drop one inch. *This is the percolation rate.*

Using the handy table, you will quickly see the size of the absorption area needed for the size house you plan to build or buy. For the purpose of simplicity, this table relates the size of the house to the number of bedrooms it contains. It also takes into account that you may want to have a garbage disposal and an automatic washing machine draining into the tank. In any case, the absorption area provided should be for at least a two-bedroom house. Thus, if the time required for the water to fall one inch is two minutes—and you have a two-bedroom house or less—the absorption area should be at least 170 square feet (2 times 85). If you have a three-bedroom house and the water drop is one inch in four minutes, the absorption area should be at least 345 square feet (3 times 115).

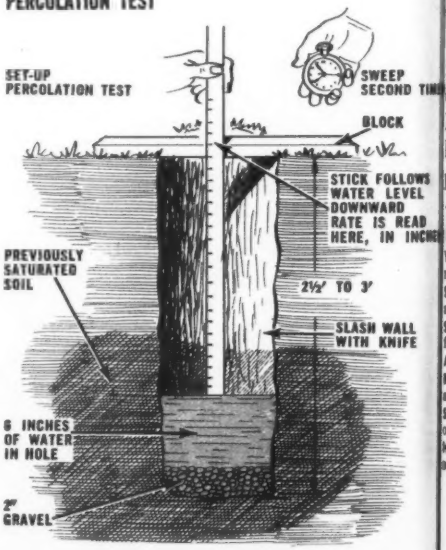
If your building site is on sandy soil in which the first six inches of water disappears in less than 30 minutes after the overnight soaking, the whole test will take but one hour since you can make

PERCOLATION RATE (Time required for water to fall 1 in.)	ABSORPTION AREA (Multiply by the number of bedrooms)
1 Minute	70 Square Feet
2 Minutes	85 Square Feet
3 Minutes	100 Square Feet
4 Minutes	115 Square Feet
5 Minutes	125 Square Feet
10 Minutes	165 Square Feet
15 Minutes	190 Square Feet
30 Minutes	250 Square Feet
45 Minutes	300 Square Feet
60 Minutes	330 Square Feet

your measurements every ten minutes, using the drop in the final ten minutes to calculate your percolation rate.

For help in selecting the most practical site for a septic tank, consult your county agricultural agent who probably has detailed soil maps of the local areas. Further information on septic tank systems can be obtained from your local health department. You'll need their approval anyway when you make the installation. •

PERCOLATION TEST



Carefree Boating Starts with Delco DC Marine Batteries!

It's fitting-out time . . . and getting things shipshape begins with installing a dependable Delco DC Marine Battery! All the features that make Delco famous in the automotive field are found in these 100% fresh marine models . . . plus special features for those who want the best for their boats. Delco DC is dry charge . . . stays bone dry until you buy it, then delivers 100% fresh power for dependable starts in all kinds of weather plus plenty in reserve for emergencies. 12-volt models for outboards, 8-volt for inboard use. Get all the power you pay for with Delco DC . . . product of Delco-Remy, manufacturer of a complete line of fine ignition parts.

Your battery dollar buys more with Delco!

YACHT ROPE HANDLES with polyethylene sleeves, bonded into case; flexible, non-conductive, resist acid and salt.
STAINLESS STEEL TERMINAL CONNECTIONS resist corrosion. Wing nuts spin on and off quickly, easily, make secure connections.
SPLASH-PROOF VENT CAPS with special traps let gas escape but keep battery fluid in.
ALL HARD RUBBER CASE resists shock, stands up under extreme heat or cold.
RUBBER SEPARATORS provide uniform fluid action on plate surfaces, prevent active material transfer between positive and negative plates.
SPECIAL ALLOY GRIDS for long life, even current distribution, resistance to over-charge damage.
HIGH-PURITY ACTIVE MATERIALS improve low temperature power, minimize self-discharge.

Delco is another General Motors reliable product available through

See your marine supply dealer.

GM U-M-S PARTS SERVICE UNITED MOTORS SYSTEM

Electric Door Opener

[*Continued from page* 115]

Edwards Company of Norwalk, Conn., and are available from hardware and electric supply stores.

Use an ordinary ten-volt bell transformer, or, if you prefer, a six-volt dry cell battery for your power supply. If you already have a transformer in use for your doorbell, you can tap into it. Connections are made with ordinary No. 18 bell wire or even lamp wire.

The transformer can be plugged into an electric outlet or be fitted into the knockout in a junction box. The Edwards transformer has an expandable nipple which locks in the knockout when you tighten a screw, as well as metal flanges for mounting on wall or baseboard.

One wire is run from one of the low voltage terminals on the transformer directly to a terminal on the door release. The wire connecting to the transformer's other low-voltage terminal is branched, each branch connecting to a floor tread switch at a convenient spot under a mat on either side of the door. Both branch wires are then rejoined and connect to the second terminal on the door release.

You can run the low-voltage connecting wires inconspicuously along baseboards and door frames, holding them in place with baseboard clips or insulated staples. If you use a stapling gun, exercise care not to staple through the insulation. Wires can also be run under a door saddle or be fed below the floor, completely out of sight, through tiny holes. To install the mortise-type opener, drill a series of holes with a one-inch bit to the required size, then square the mortise with a chisel.

This door release installation has other applications. It can serve as a secret opener to a storeroom, workshop, or other room that you want to keep locked at all times but to which you yourself want immediate access without the nuisance of a key. A similar set-up can also be used as a gate opener or to keep a child or pet in a fenced yard, but intruders out. •

LOOKING FOR LONGER WEAR IN SAFETY SHOES?

TRY Iron Age SAFETY SHOES with NEOPRENE SOLES!

Neoprene soles give longer wear . . . resist oil, grease, chemicals and cold weather cracking. Neoprene soles are resilient . . . cushion each step . . . help make standing jobs less tiring.

Ask for neoprene soles the next time you buy safety shoes.

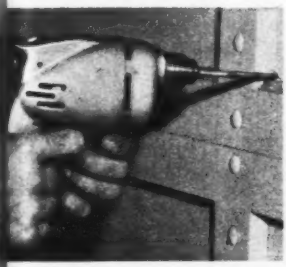
DU PONT

BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY

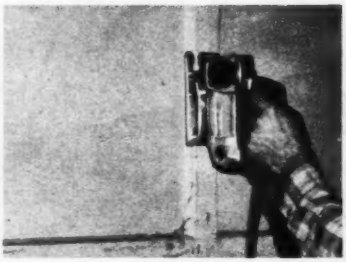
WEEKEND PROJECT

MAKE THIS your next weekend project! Just look at the difference the glazing of this garage door made in this workshop corner. Both pictures were taken under identical outdoor lighting conditions. Exposure: five seconds at f-32, Eastman Royal pan.

LET THERE BE LIGHT



FIRST STEP is to drill a pilot hole in each corner of the wood panel.



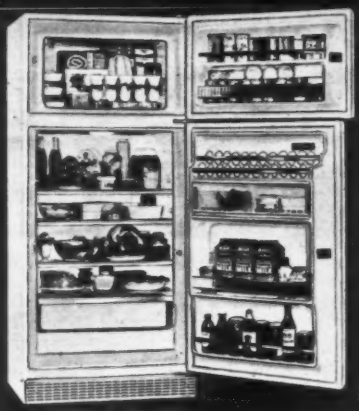
THEN USE A PORTABLE saber saw to cut away the wood between the stiles of the garage door.

AFTER TRIMMING and sanding, apply a coat of paint to the exposed wood.

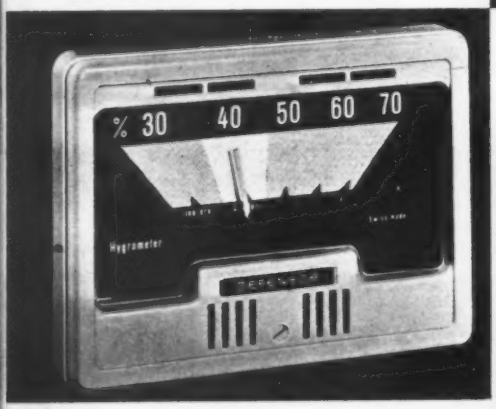
QUARTER-ROUND molding should be installed so that it is flush with the inside of the door. Set the brads below surface.

AFTER installing the glass (have it cut at least ⅛ inch scant) the final step consists of puttying. Paint after the putty has dried.

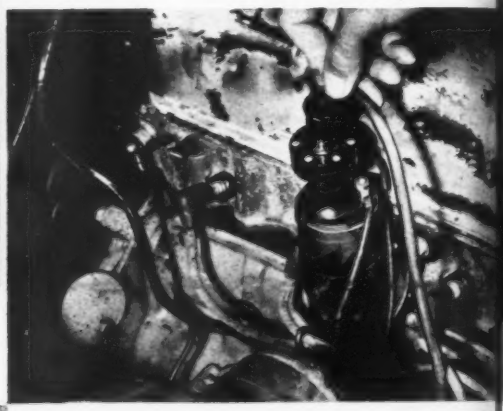
MI's *HARDWARE* STORE



PUSH a button on this refrigerator and you convert compartment into a freezer unit.
Philco Corp., Philadelphia 34, Pa.

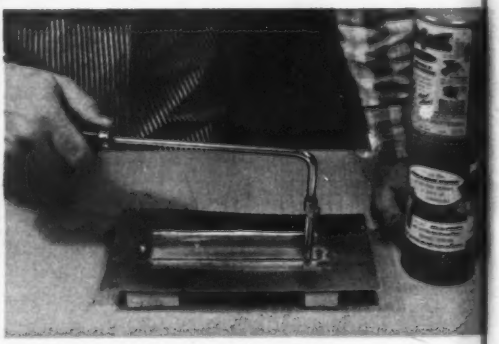


HUMIDITY range from 25% to 75% is indicated on hygrometer. $7.95.
Elden Sales, 920 E. Lincoln, Birmingham, Mich.



IGNITION booster improves car engine performance, is simple to install. Cost, $9.95.
R. D. Fageol Co., Kent, Ohio

TOOL basket is water-repellant canvas over tinned steel wire frame, $2.75.
Handy Folding Pail Co., Inc., 17 Thompason St., N. Y. 10



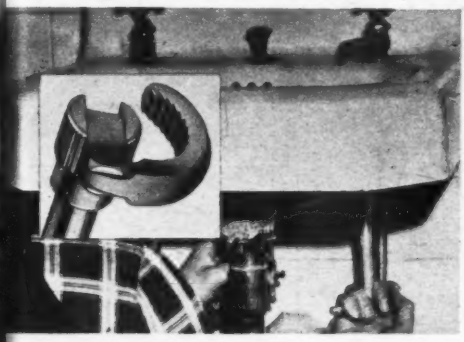
ALUMINUM is easily soldered with a new tool which eliminates tinning and fluxing.
Reynolds Metals Co., Richmond, Va.

PLASTIC PASTE mends wood, plastic or metal.
Baird Dynamic Corp., Stratford, Conn.

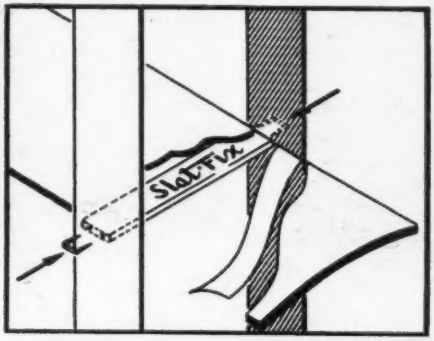
NEW LINE OF lamps burn with the effect of a flame.
Duro-Lite Lamps, Inc., North Bergen, N. J.

WHAT'S NEW

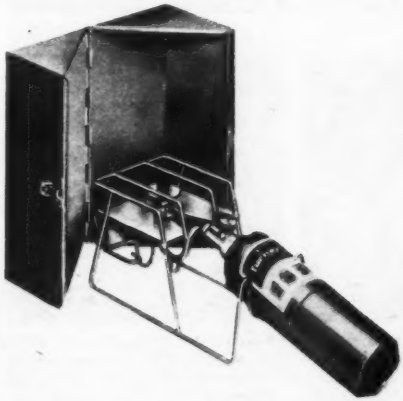
A chemical that dissolves fuel tank sludge, Tank-Cue, is sold by Document House, Box 242, Greenwich, Conn. . . . Edith's Custom Craft, 41 River St., Deep River, Conn., markets an inflatable hanger for drip-drying. . . . A wall chart on grinding wheel safety is available from the Grinding Wheel Institute, 2130 Keith Bldg., Cleveland 15, Ohio. Write on company letterhead. . . . Solder in a tube is made by Hercules Chemical Co., 416 Broadway, New York 13, N. Y. . . . For a free list showing all FM radio stations in the U. S., write to Blonder-Tongue, Inc., 9 Alling St., Newark 2, N. J.



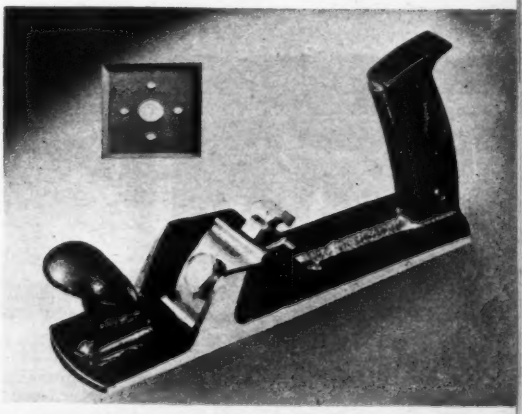
BASIN WRENCH has pivoting head and a long handle for those hard-to-reach spots.
Schaul Mfg. Co., 6300 Roland Ave., Cleveland 27, Ohio



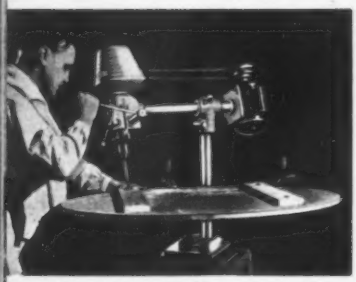
PLASTIC strips replace torn ladders in venetian blind tapes. Price, 39c a dozen.
Slat-Fix Co., 72 Spruce St., Hicksville, N. Y.



FOLD-AWAY propane stove has a carrying case that acts as a windscreen, is $13.95.
Turner Corp., Sycamore, Ill.



PLANE with four-edge, disposable cutter blade eliminates the need for sharpening.
Sears, Roebuck and Co., Chicago 7, Ill.



Angular drilling for the splayed legs on a coffee table is no problem with this tool because the angle of right or left tilt can be set by a calibrated scale and locked into position. Resetting head to vertical position is simplified by setting of the automatic stop into a milled groove.

Inlay routing in the center of a 30" x 40" project is possible because there is 16⅜" capacity between the column and the router bit. Use of the fastest of the four speeds available makes this a smooth operation. Controls are conveniently grouped "up front" for safe, positive action.

Spindle drilling on an extra long hand rail *does not* require a special fixture or jig because the head tilts. Big ¾" x 23¾" x 15⅞" table gives adequate support while remaining parallel to the base. Laminated wood work surface is mounted to a fully machined 8½" x 9" cast iron table.

New radial drill press

makes "impossible" drilling easy

DELTA 32" RADIAL DRILL—basic machine complete with ½" capacity geared chuck, belt and motor pulley.
Weight 85 lbs—only **$89.50** (slightly higher in the West).

Here's just what you'd expect from Delta—a brand new radial drill—specifically designed to handle drilling jobs you *can't* do on a conventional drill press. There is almost no limit to the flexibility this tool puts at your fingertips—and you'll really appreciate the big capacity. The head swivels 360° around the column, tilts more than 90° left and right, travels almost a foot forward and back—yet the work always remains parallel with the base. You can drill to the center of a 32" circle, rout, sand, mortise, do dozens of operations at your choice of four speeds (700,1250,2400,4700 r.p.m.) on a wide variety of materials.

You can count on this tool to extend your skill, broaden your range of projects. And because you know tools, you know you can count on the precision, ruggedness and safety that Delta's 31 years of experience build into tools used throughout industry and in home workshops.

Consider the many ways you can do more jobs better, quicker and easier with the *newest* Delta tool—you'll want to see the Radial Drill in action! Visit your Delta Dealer (he's listed under "TOOLS" in the Yellow Pages) or your leading Department, Hardware or Building Supply Store. Do it soon!

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From the manufacturer of the world's finest *professional* tools comes this versatile Model 152—actually 7 saws in one! Use it for hundreds of jobs—it's a ripsaw, cross-cut, coping, keyhole, scroll, jig, and hacksaw. Many Porter-Cable features make it the most popular tool for every home craftsman—exclusive trigger-control gives you hairline accuracy, patented "Magic Circle" Insert Disc virtually eliminates chipping of plywood, blower gives constant visibility of cutting line, cuts 2 x 4's fast at 45°. This remarkable all-purpose saw can be used for all types of cabinet work, home construction, metal working, and countless hobby projects.

See your Porter-Cable dealer NOW—or write for folder.

PORTER-CABLE MACHINE COMPANY

6264 Marcellus St., Syracuse 4, N. Y.

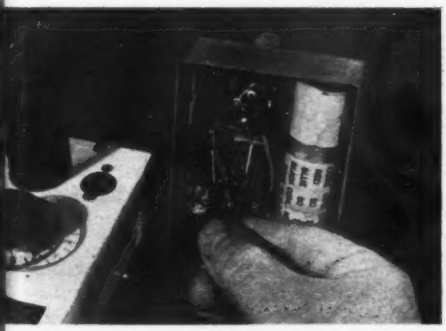
Your Own Tube Tester

[*Continued from page* 113]

ESTING TUBES. The tube chart tells how o set the switches for the tube under test.

rutch tip is cemented into the top of the ase. Separate the other end of the ord and solder a long headless brass scutcheon nail to each wire. Then wrap everal turns of friction tape around the onnections to serve as finger grips.

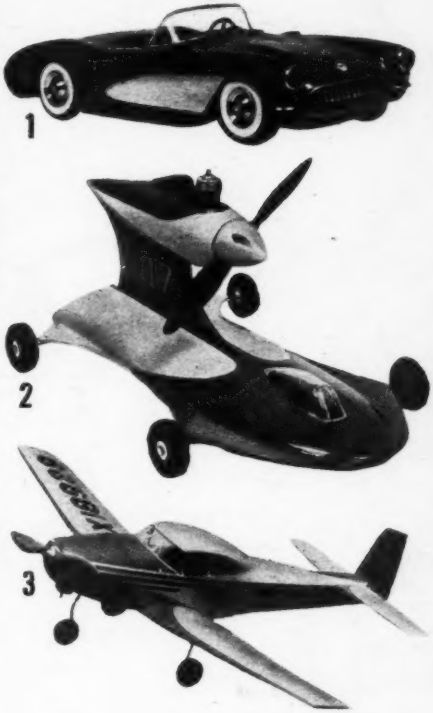
To use the continuity tester, plug it into he eight-tube socket of the tube tester and nove the *Power* switch to the *Hi* position. With the selector switches in the *K* position, switch *4* or *5* (but not both) is moved o the *P* position. The neon light will glow when you touch the prongs together. It will also glow when the prongs are touched to he leads of a good resistor, but not when ouched to the leads of a good condenser. •



TEXT tells how to make your own continuity ester for checking resistors and condensers.

What's Your Plan, Man?

A limited number of full-size plans for these popular MI models are still available. Check off the plans you want on the coupon below. As always, it's first come, first serve—so mail in your order today and get in on the fun.



1. Here's an 18-inch scale model of the Chevrolet Corvette. It has a Fiberglas body, takes a .14 gas engine and will do about 40 mph. Real head and tail lights add to the realism.

2. Scamper is a powerful propeller-driven car or boat that will speed down a runway, at the end of a tether or over the water at speeds ranging from 20 to 40 mph. Length is 15 inches.

3. The North American Navion is a smooth-flying control-line model. It has a 36-inch wing span and takes a .19 to .49 engine. Plans include photos, material list and instructions.

Send 50¢ for each plan ordered to Mechanix Illustrated Plan Service, Fawcett Building, Greenwich, Connecticut.

Please send me the plans I have checked. I am enclosing the required amount.

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I am also enclosing 10¢ for your latest MI Plans Catalog containing pictures and descriptions of 132 plans. ☐

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"KANGAROO" LAMP TABLE

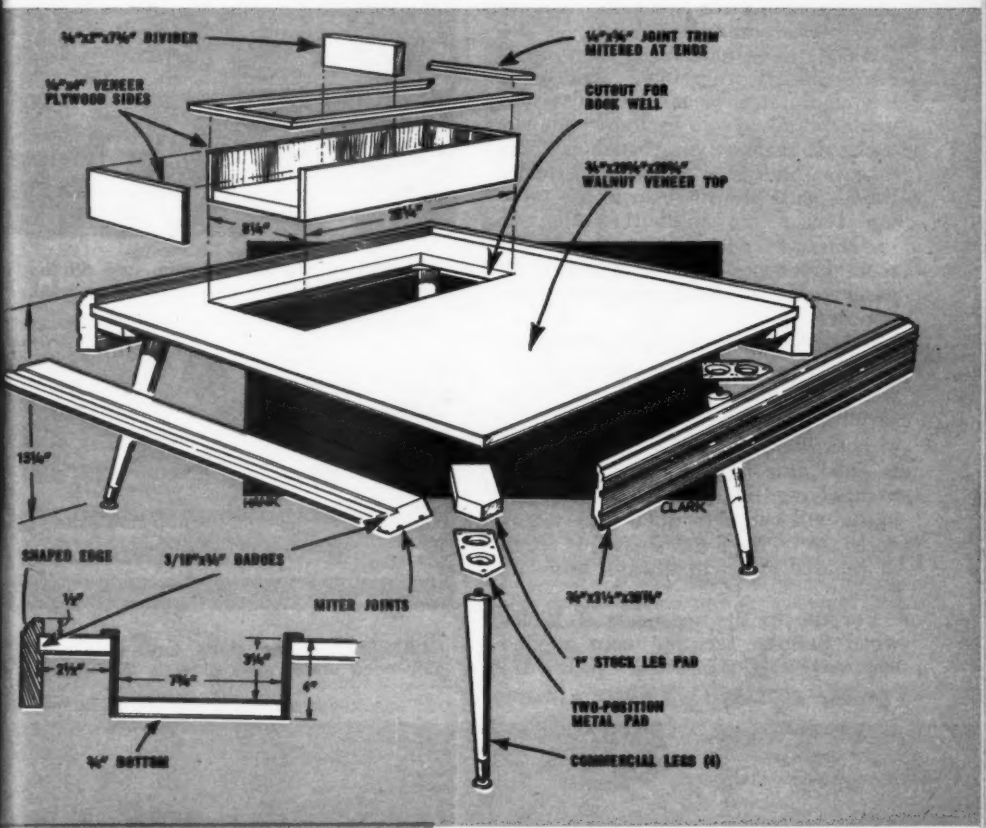
It has built-in storage for 48 paperback books.

By Roe John

THIS handsome table was designed to match the sofa bed featured in the August '59 issue of MI. Like that trim piece of modern furniture, it's made of rich walnut and has tapered brass legs. The top is unique in that it has a built-in book trough which holds approximately four dozen pocket-size novels neatly stacked on edge.

Material requirements for the project are few. You'll need a 30x30-inch sheet of ¾-inch lumber-core walnut plywood,

a 24x24-inch sheet of quarter-inch walnut plywood and 11 feet of 1x4-inch solid walnut. A five-foot length of ¼x¾-inch trim to border the book trough may be salvaged from waste 1x4-inch stock. The 14-inch high brass legs are available from the Dennix Co., 33-04 Downing St., Flushing 54, N. Y.



As is evident from the drawing, construction is rather basic. Cutting the top presents no problem except for the fact that the average jig saw won't permit a full swing of the 30x30-inch panel. Therefore, to cut the rectangular opening, you'll have to bore a hole at each corner of the outline and saw from both directions on the long sides.

When the top is cut and sanded

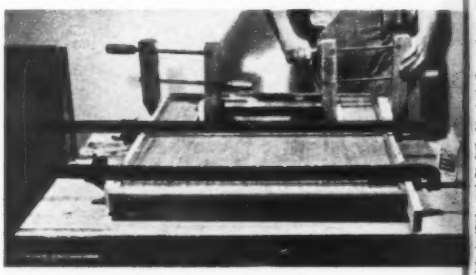
◀ **JIG SAW is used to cut rectangular opening in walnut plywood table top.**

smooth, the skirts are next. A little care should be taken here because one thing which will do more than anything else to mar the beauty of the finished piece is a poorly-mitered, patched-up corner. Yet there is no magic formula for achieving a truly professional miter joint. Success depends entirely upon the effort you put into making preliminary trial cuts. Due to human or mechanical error, you can't always go by the reading of the angle scale on your bench saw. So, take two pieces of scrap wood, make the 45° cuts and fit them to the table top. If the angles don't butt exactly, adjust the saw blade and try again. You'll soon achieve a perfect fit and then all parts can be sanded smooth before assembly.

A few words on gluing are in order: Don't try to squeeze the sap out of the wood with clamps. All that is necessary for a good bond is a firm meeting of both surfaces with a very thin film of good glue between. Be moderate in applying the glue. Flooding the joints will cause trouble; glue which oozes out on the finish surface is tough to remove and will always leave its mark.

For the finish, two coats of Weldwood Satinlac lacquer were applied and each [*Continued on page* 177]

SQUARE up the miter gauge and tilt the arbor precisely 45° for an accurate joint.



CLAMPS hold the skirts until glue sets; soft wood under jaws protects the walnut.

LEGS are hand-tightened in brackets which are screwed to one-inch corner blocks.

SHAPER molds edges of the skirts; use a hold-down, keep hands away from cutter.

Your New Valiant

[*Continued from page* 131]

speeds as well as at idling. Valiant owners shouldn't have to fast-idle the engine to keep an ailing battery on charge.

Those special battery vent caps should not be replaced with ordinary caps since they serve to prevent escape of battery spray during periods of excessive charging. Because the hood is low and near the battery, the new-type caps prevent corrosion of the metal. Just for the record, the 12-volt battery has 54 plates and the negative terminal is grounded.

This matter of negative grounding is especially important because of the use of the alternator. Should a replacement battery be installed and connected with its positive terminal grounded, the rectifiers may be burned out. Also keep in mind that if the alternator is to be disassembled, the brush assemblies should be removed first; otherwise they may be damaged. A prelubricated ball bearing supports the rotor shaft of the alternator at one end and a pre-lubricated roller bearing does the job at the other end. Low output, accompanied by a growl or hum is the result of a shorted phase or a shorted rectifier, whereas too high an output is caused by an open rectifier or open phase.

When I took the wheel of a Valiant demonstrator, I cranked the engine by flipping the ignition key to the right. Just to the left of the steering post, on the dash, are the buttons for operating the special Torqueflite transmission. When I pressed the Drive button and accelerated the engine, the car did not move. I had released the parking brake over at the left side of the cowl and I was sure I had pressed the Drive button all the way in. Then it was that I noticed a small lever marked Park just below the transmission button control group. *The car can be locked up through its transmission for added protection in the event of trouble with the parking brake.* Pushing up this little lever released the car for action and away I went.

The special automatic transmission is wrapped in a one-piece aluminum housing and is water-cooled. It holds 13 pints of special automatic transmission oil and has three forward speeds. This is handy for ob-

[*Continued on page* 174]

THE WELDWOOD WORKSHOP CLINIC

TIPS ON WOOD FINISHING from our file of "most-asked" questions.

Q. How can I prevent knotty pine paneling from turning yellow?

A. First, sand wood thoroughly, then apply a first coat of new Weldwood® Satinlac Lightener right away. This anti-wetting agent preserves the light, freshly sanded virgin tone of the wood—withstands yellowing or darkening with age. Follow with 2 coats of new, improved Weldwood Satinlac for a lasting, soft-luster finish. Satinlac's built-in ultraviolet screen provides additional protection against color change from sun's rays.

Q. Is it possible to give exterior wood a stain that resists fading?

A. It certainly is! New Weldwood Exterior Stains are a deep-penetrating combination of hard-drying resins, oils, and pigments that last through rain, sun, and wear. Choose from 4 natural-looking stains: Redwood, Driftwood, Sierra Brown, and Cascade Green. Each subtly brings out the wood's native grain while adding rich, beautiful color.

To protect wood from termites, rot, use new Weldwood Wood Preservative. This high "penta" sealer makes an excellent foundation for stains, paints, or varnish.

Send your questions on wood finishing, gluing, and working with plywood and prefinished wood paneling to: The Weldwood Workshop Clinic, United States Plywood, 55 W. 44th Street, New York 36, N. Y.

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Book Notes

UNDERWATER WORK by John E. Cayford; Cornell Maritime Press; 232 pgs.; $5.00.

MANUAL for Scuba divers concerns commercial, salvage and construction operations; includes chapters on cutting and welding, safety measures, laying pipe, blasting, photography and other subjects; *the* book for the underwater worker who's going into business for himself; illustrated.

* * *

PRINTED CIRCUITS by Morris Moses; Gernsback Library; 224 pgs.; $2.90.

A VIRTUAL encyclopedia on the title subject; tells how such circuits are made and used, what components are used with them and how to maintain and apply them in home, industrial and test equipment.

* * *

SPORTS CARS OF THE FUTURE by Strother MacMinn; Sports Car Press; $2.90.

THIS 126-page paperback describes in text, drawings and photos an eye-popping array of tomorrow's super-sleek road monarchs—a preview to excite the most blasé car buff.

* * *

LOOKING AT THE STARS by Michael W. Ovenden; Philosophical Library; 192 pgs.; $4.75.

A HANDBOOK that gives young star gazers an understandable interpretation of the wonderful ways of the heavens; profusely illustrated, it is an excellent introduction to astronomy for youthful enthusiasts.

* * *

THE FIRST QUARTER-CENTURY OF STEAM LOCOMOTIVES IN NORTH AMERICA by Smith Hempstone Oliver; U. S. National Museum, Smithsonian Institution; 112 pgs.; $1.00.

FANS of the old-time iron horse will cherish this little bulletin written by the Smithsonian's Curator of Land Transportation; text, diagrams and photos review the early history of the steam locomotive; also tells which original locomotives still survive and where they're located.—*D.H.*

Your New Valiant

[*Continued from page* 173]

taining added engine compression braking when going downhill, using the button marked 2 for a 1.45 to 1 ratio. Low, or button 1, has 2.45 ratio and should be used for very steep downgrades.

Valiant's brakes carry riveted brake lining with a total area of 153.5 square inches. The parking brake operates mechanically through both shoes of each rear wheel rather than on a drum on the propeller shaft. Applied by pressing a pedal, the parking brake is released by pulling up on a small lever.

When you lift the hood of the luggage compartment you are immediately aware that it is nicely counterbalanced with springs and needs no folding bar to keep it raised. While the lid carries a simulated covered spare, like some other Chrysler cars, the spare is actually located in the flooring so that the trunk has 24.9 cubic feet of storage space.

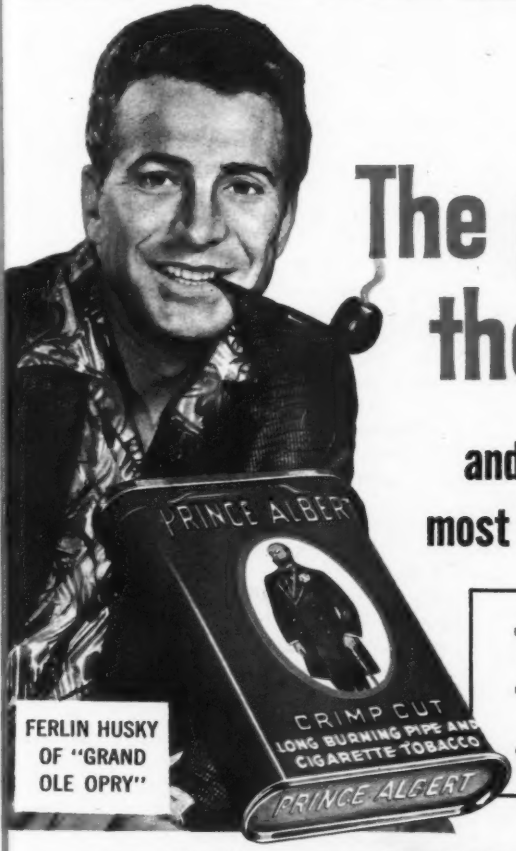
This is the only new compact available with power steering. The arrangement is smaller than on the Plymouth but servicing is essentially the same. It's a full-time system and only Mopar power steering fluid should be used. For the manual steering gear, which is a worm and recirculating ball type, two adjustments are required. One is for worm bearing pre-load, the other for ball nut and sector gear mesh. It is important that any such adjustments be made carefully and in a special order recommended by the factory. If an adjustment is needed, make sure the mechanic follows instructions given in Valiant's service information bulletin, No. 19-1.

Some of the early cars came off the assembly line with brass studs at each end of the exhaust manifold. If these fail, they should be replaced with steel studs, part No. 2121585. To take off an old stud, just lock two nuts together on the stud and then unscrew the inside nut. The job can be done in a half hour.

Valiant carries a special version of Chrysler Corporation Torsion-Aire suspension which has nothing to do with air. It is a combination of torsion rods, ball joints, Oriflow shock absorbers and asymmetrical leaf rear springs. Sedans have

four leaves in each rear spring; station wagons (the Suburbans) have five leaves. Front shackles of the rear springs are a pivot type while the rears are shackled; both are rubber-bushed. This means that no petroleum lube should be applied if squeaking develops. Use brake fluid or special lube for rubber.

Due to the fact that the standard transmission is rotated 30° to the left to reduce the floor hump, the shift lever is mounted on the floor at the driver's right hand. •



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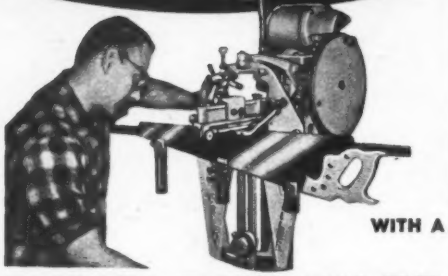

WITH A

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A Fresh Water System

[*Continued from page* 143]

forward solution would be to weld a fitting for a petcock in the top of the tank. However, we had neither means nor knowledge of welding, so the tube method was devised. This calls for drilling a diagonal hole in the nipple so that ⅛-inch O.D. copper tubing can be worked through and bent in an arc to come close to the inside top center of the installed tank. Determine the length and bend of the tubing by trial and error and then solder it in place, taking care not to clog the inside of the nipple with solder. Though the intake is restricted by the tubing, the tank fills quite rapidly; however, it would not be wise to restrict it further. When the nipple is finally tightened into the tank, the location of the petcock on the outside can be used to determine that the tube is pointing upward on the inside.

At the outlet end of the tank, the nipple will have to be reamed a bit in order to force the ⅜-inch copper tubing in for soldering. When this is done, a scratch or a dab of paint on the nipple, opposite the downward curve of the tubing, will indicate the correct position of the tubing when the joint is finally made up.

The valve on the outlet side really isn't necessary but was installed as a means of testing the system for leaks. It is followed by a nipple and an air valve stem extension which is available at auto supply stores. As indicated in the drawing, it might be desirable to install a valve above the tee to keep water from squirting at the instant the tire pump is being removed. This, however, is of minor importance. Naturally, all pipe fittings should be brass for ease of soldering and freedom from rust.

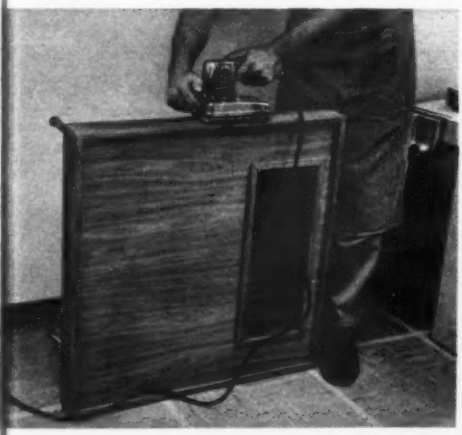
To fill the tank, normal pressure from a water system is required. You could not, for instance, pour water in if the tank were standing on end. In practice, we seldom use the air vent to fill the tank to capacity. We've found that filling the tank as much as possible without venting compresses the air inside and provides pressure that allows us to take several one-day trips without refilling or using the tire pump. On long cruises, we fill the tank to capacity and use the pump several times until the water drop allows pressure build-up. •

Kangaroo Lamp Table

[Continued from page 172]

TRIM is temporarily fastened with brads to test fit at the corners before applying glue.

lightly rubbed with a fine (00) steel wool. Then a dry stick filler was applied to the few nail holes. Two coats of wax, rubbed down, will make the walnut sparkle with a smooth, silky look. •



OUTSIDES may be sanded after assembly but top and insides should be sanded in advance.

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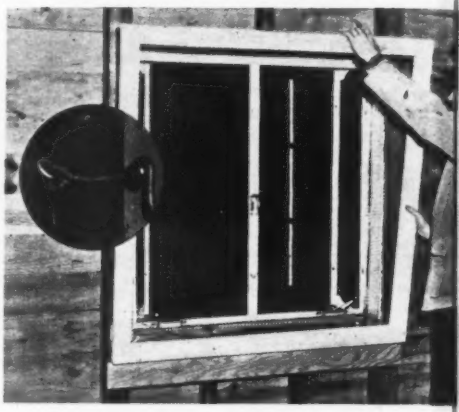
Mobile Attic Fan

[*Continued from page* 148]



TWO ROUNDHEAD screws and hooks hold hardware cloth screen behind open window.

which can be locked tight during the months when the fan is not in use *and* the installation of the fan on a wheeled box or platform which will enable you to move the fan when it is not needed.

The first step is to remove the existing louver and measure the opening to determine what standard size casement window will fit the opening. Casement windows are made in more than 20 sizes so the chances are you can get a window

A SET of double ball-bearing casters, one in each corner, completes the box assembly.

which will fit the existing opening within one or two inches. In this particular case, a Ceco aluminum casement window, 37x38⅜ inches (No. A2323) was used, which was the closest possible size to the window cut-out. A 2x4 at the bottom and a 1x2 at each side made up the discrepancy between the opening and the new casement window.

Before the casement window was screwed in place, aluminum flashing was used at the top and bottom to insure a weathertight fit. As further insurance, the window sill at the bottom was slightly canted so that rain and snow from the glass would drain to the outside and not back into the attic. After installation, all joints were carefully caulked. Putty and paint are fine for this job.

The next step was to build a boxlike platform which would center the fan in the middle of the window opening. The dimensions of the box from left to right and front to back are relatively unimportant as long as there is sufficient "sitting room" for the base. However, the distance from *top to bottom* should be accurately determined so that the fan blades are in the exact middle of the opening. In determining this distance don't forget to make allowance for the height of the casters. The four, two-inch, double ball-bearing Colson casters, used for this job, are 2¾ inches high.

To prevent birds and squirrels from entering the attic when the fan isn't operating, a screen made of half-inch hardware cloth mounted on a 1x2-inch framework was constructed. The screen rests on the window sill and is held in place by means of two screw eyes which slip over two roundhead screws as shown in one of the photographs.

As an added precaution, an extra switch was wired in series with the fan motor. Normally, the fan is put into operation by turning on the usual switch located in the hallway. However, just to be on the safe side, this second switch was wired in series

[*Continued on page* 186]

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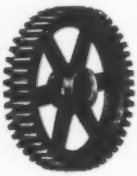

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Cars Built For Fun

[*Continued from page* 64]

latest, TR3, is still a fairly homely little beast; however, now it has teeth—sometimes called a grille. This is the hairiest car of the whole under-$3,000 bunch and *the* car to buy if performance, either on a race course or in a big-time rally, is what you're looking for. This job, selling for just below $2,700, can top 110 mph when in tune, knock hell out of ten seconds for 0-60 mph and knife through corners like a cleaver separating a rib. It is equipped with excellent disc brakes and a good gearbox. It has fantastic roadability and an engine as reliable as sundown in the Poconos. The TR3 is a big-time sports car for a low budget connoisseur. As if that weren't enough, it's very comfortable for two people.

The Fiat 1200 Spider is another rig that fits into our fun-car category. This is a neat convertible powered by a great little four-cylinder engine displacing only 74 cubic inches. It has an excellent four-speed gearbox and beautiful appointments, including swivel-out seats for easy entrance and exit, if your kilt happens to have an extra tuck in it. The performance, considering the engine size, is remarkable as the car can hit a full 91 or 92 mph and break 0-60 mph in 18 seconds flat. It is comfortable, and would be a real fun car for a couple to cruise from coast-to-coast in while getting better than 30 mpg. Though this is not a strict competition car in any sense, it certainly would be fun to have on a rally. If you happen to be married, your wife will have a ball driving it to and from the supermarket.

The Austin-Healey Sprite. This is the lowest-priced car on our list that qualifies as a bonafide sports car. Selling for $1,795 in New York, and powered by a little 57 cubic-inch mill, it has a top speed that just tickles 80 mph and all the road feel of a Ferrari. When it first made its appearance about two years ago, the mounting of the two headlights (which gives it a bug-like appearance) brought a lot of adverse criticism but, like olives, you soon get used to them. The Sprite today is considered a very neat little fun car. It is remarkably comfortable and a real gasser to drive. If your family commitments aren't too large (meaning more than one wife or one girl

friend), you'll get more fun out of owning a Sprite than suddenly being declared tax-exempt.

The Karmann-Ghia hardly qualifies as a sports car in the true sense but gets under the wire through its good looks and thoroughly reliable Volkswagen chassis and power plant. It doesn't have the space of a standard VW but it does have average sports car room of the Austin-Healey type. Two people can be very comfortable on two lush seats and there's plenty of space behind the seats for offspring or a 90-lb dog. Without kids or dog, the back compartment can be used for extra luggage space. As a rally car, with a top speed around 80 mph, it'll prove very adequate except in the big events where a good head of top speed and 0-60 mph in ten seconds are essential. Anyway you slice it, the Ghia is a real fun basket for under $2,500 and from a quality standpoint it just can't be topped for less than $3,500. It should last for years as a combination work-and-pleasure car and you get better than 30 mpg.

The Volvo, though not considered a true sports car, has beaten a helluva lot of real sports cars in open competition and hot rallies. Homely as a sneezing platypus, with promises of prettier models on the way, this is one of the greatest hunks of machinery produced in Sweden since Greta Garbo. Zero-60 mph in less than 13 seconds and a top speed of close to 100 mph make this job, at $2,342, a true connoisseur's car and one I feel positive no one ever regretted buying. Its workmanship and construction are tops.

The Granturismo Saab is a hopped-up version of the standard two-cycle job. It has won dozens of rallies in class competition. The latest model sports a brand-new four-speed, all-synchromesh gearbox. This front-wheel drive rig is hairy enough to bring many a monster to its knees when the terrain gets tough. It is a real ball to drive. With a price of $2,768 in its Granturismo suit (which means loaded with extras for rally competition), it can top 100 mph. It's comfortable and reliable and the array of instruments on the G.T. model would bring stars to the eyes of a Pan American pilot. This is a car for the serious rally man to consider. It has fantastic traction and great roadability.

[*Continued on next page*]

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The Renault Caravelle, France's answer to the Karmann-Ghia, doesn't fit into the sports car category by any twisting of the imagination but it certainly is a fun car. It has a top speed of just under 80 mph and gets from 0-60 mph in 20 seconds. Prices start at $2,395 for the soft-top convertible. There is also a fixed hardtop job and a removable hardtop convertible. The biggest boot you might get out of it, aside from running a top French bucket, is the fact that it'll create quite a sensation everywhere you go with its extraordinary good looks.

We've already named the top cars in the $3,000 Fun Class with three outstanding exceptions: the Falcon, Corvair and Valiant. We must name these as fun cars if the Caravelle and Ghia are to be included. The Valiant is the only car of the three Americans to approach Volvo performance in stock form and it could eat the Ghia and Caravelle alive without any indigestion. There are a number of other cars that could be squeezed into the fun category such as the Simca Oceane, Berkeley, Vespa (a ball to drive) and the Fiat Bianchina. And don't overlook the Morgan, the last car being built with truly uncompromising classic looks. In fact, there are about 60 other cars that could qualify as funsters—but these named are the outstanding ones with $3,000-and-under tags.

In summing up, as Hogan McGuiness, the great Japanese philosopher once said, "The world and you have never been as old as you are right now." So drive a sporty fun car while you still have a chance. Remember, the American family sedan will always be around when you get too old to play.

—Tom McCahill

Tom Tests The Alpine

[*Continued from page* 90]

with his back to starboard and his feet to port, or vice versa. But whether you decide to pile drunks back there, extra luggage or animal friends, it's a big improvement over having a useless deck lid that comes right up to the back of the front seats, as is the case with so many sports cars.

The trunk, considering the size and type of car, is amazingly large and the spare tire is stowed beneath the main shelf, out

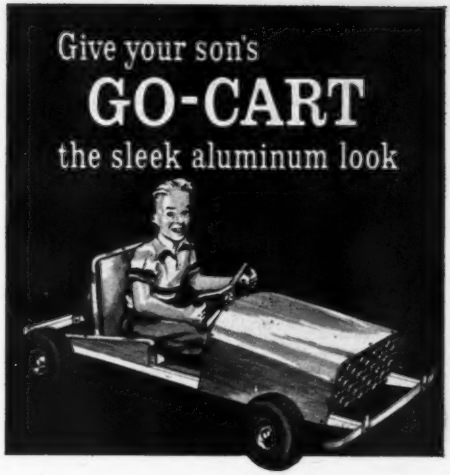
of the way. The gearbox is as smooth as an oiled ear lobe, with a floor shift lever about the size of an airedale's tail. The body and frame are what they call "Unitary" construction, similar to what we call Unitized or Unibody—you know, *togetherness*. This is a great feature for eliminating squeaks and rattles and is also a weight saver.

The brakes are Girling four-wheel hydraulic; disc in the front and conventional leading and trailing shoe in the rear. The steering is clean and fast without lag. Even the severest potholes are not telegraphed up to your hands, as is the case with many light, fast cars. In addition to an excellent speedometer, you get a tachometer. The suspension has independent coils in front and semi-elliptics in the rear. The electrical system is 12-volt Lucas and the fuel pump is mechanical. The car also has twin horns and a blessing from Mr. Sunbeam's mother.

All this doesn't mean a thing unless the car gets over the road right. In this department the Alpine is truly superb. It has two drawbacks and both come under the heading of Driver Comfort. If the motorman is any taller than an eggplant and decides to own this heap for some time, the first thing he should do is re-work the gas throttle linkage so that he'll have more right leg room with the left-hand-drive American version. This is probably okay in England with the right-hand twirlers but not in the States models. There is enough legroom when stabbing for the brake or clutch to satisfy Wilt The Stilt.

By an odd bit of shaping under the bonnet, the firewall protrusion makes the right foot on the gas pedal feel like you're driving a Dodgem. It would be a simple matter for a blacksmith or a quick guy with a welding torch to bend this entire array slightly to the left, giving the right foot several more inches of throttle length. If you are on the shortish side, the present set-up might not bother you in the least but if you even approach six feet you'll be unhappy with it. I liked this car so much I was strongly thinking of buying one. If I did, my solution would be some bending and repositioning of the current throttle. This should give me all the room I need at the cost of a fast $20 bill.

[*Continued on next page*]



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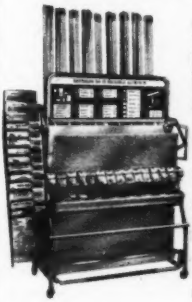

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My one other beef is that a car so finely thought-out as this should have a telescoping steering wheel for fat, lean and medium bellies. In sports car driving it is very important that the steering wheel be positioned where the driver feels he has the most control, regardless of his belt-line. Some men drive with their arms completely extended, while others like the wheel nuzzling their chest. Either way is right, provided it suits the driver. There's not much you can do about providing a telescoping wheel for the Alpine without going into relatively heavy dough but you *can* re-work that throttle. Back to the road. . .

We picked up our test car in Long Island City and drove it to the hairy wilds of Bucks County where English is spoken—sometimes. After two or three weeks of beating the Alpine over hill and dale (and I *mean* beating it!), I found this car grooving through the corners with all the ease of a tomahawk going through a soft scalp. On dusty and gravel roads you can throw it in and out of slides like flipping a venetian blind. At all times you're the take-charge boy, not the car. On a well-known turnpike (which shall remain nameless) in the wee hours of the morn this little red Glockenspiel clocked 102.4 mph over a measured mile with a slight quartering side wind. In full competition tune it could undoubtedly eke out a little more.

The big thing at high speeds is the fact that this car gets down the pike like a paper clip from a two-pound-test rubber band. Acceleration? Considering the 1½-liter engine size, it's pretty sharp. Zero-30 mph takes 4.8 seconds and 0-60 mph needs 13.2 seconds. This won't cause you much embarrassment unless you bump into a nasty guy in a Pontiac. During the three weeks we had the test car it was used under a variety of conditions which included freezing weather, heavy rain and deep, muddy roads. While pulling through mud, I realized I was doing something that would have hung up a lot of unbalanced Detroit cars. In this low-slung bug it was just plain, dirty fun.

In summing up, the Sunbeam Alpine is one of those cars that comes along very seldom. Its looks are as sharp as a weasel's teeth. Its personality is brimming over with swashbuckle and it has more character

than an old movie with an entire cast of Lionel Barrymores. The Sunbeam Alpine isn't the greatest sports car I've ever twirled down the pike but in my book, at its price tag of $2,599, it's the best offering dollar-for-dollar and swashbuckle-for-swashbuckle since the first Austin-Healey hit here in the early '50s. This is a *fun* sports car that may not be sensational in 1½-liter Open Racing in its present form. But as a top rally car and possibly production-class sports car, it's going to take a lot to beat it. •

Spring Fishing

[*Continued from page* 70]

April, all along three choice miles of a single top-ranking New York trout stream, I saw men sitting in parked cars with engines running and heaters on full blast. Up and down the banks were groups of anglers huddled red-faced and blue-lipped around fires as a northwest breeze kept the mercury down to a bitter 36°F.

Today there seems to be an antipathy toward wearing "long-handled" underwear, especially among city slickers. So every season hundreds of thousands of men and women set out from towns and cities for a week or more of trout or salmon fishing as soon as the season opens (sometimes literally breaking the ice to get fishing) wearing the same thin cotton or nylon underwear that they wear in their steam-heated homes and offices.

The most practical underwear that I've found is made by Duofold and has a cotton side next to the skin, eliminating all chance of wool itch, and a woolen side next to your outer garments. In between the two layers of cloth there is a dead air space creating a fine barrier to cold penetration, without bulk. Most stores handle these garments in all sizes. Other good types of underwear are regular woolen longies, cotton longies and thick cotton seat shirts and pants.

Socks: two pairs of thin woolen socks will keep your feet warmer than one pair of thick ones. Socks should fit perfectly, without the least bit of tightness even at the toes.

Most anglers make the mistake of packing one thick woolen shirt for the trip. Even if this shirt is thick as a blanket, it

[*Continued on page* 188]

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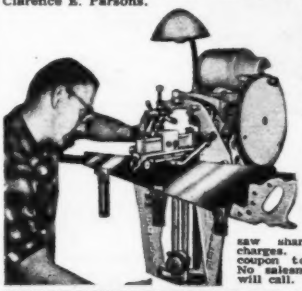

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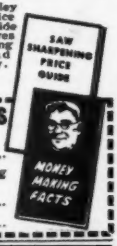

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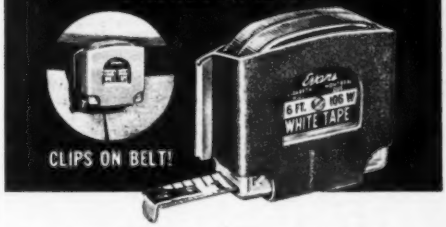

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Mobile Attic Fan

[*Continued from page* 179]

with the first, so that the job of moving the fan and installing the screen can be done with ease of mind. This switch also permits the attic lights to be used when the fan is "off."

The louver is, of course, removed and discarded, which now makes the fan much more efficient as there is no baffling action by the louver vanes. To put the fan in operation, the windows are cranked so that they are wide open. The fan then has only to blow through the relatively friction-free hardware cloth. When the fan is not in use or when it is not needed, it can be moved out of the way with very little effort. The window cranks are then accessible for closing the casements.

This setup is a big improvement over the prior one using a louver. Now the attic is flooded with daylight whether the fan is in use or not. The casement window forms an absolutely tight seal against rain and snow and the disturbing clangor of loose louver vanes during a wind storm is pleasantly absent.

If you're wondering what the handle on the front of the platform is, it's for a swinging door which covers a storage compartment for miscellaneous small items.

—*Robert Brightman*

Golden Hammer Awards

[*Continued from page* 126]

Pleasure Ridge Pk., Ky. . . . Bernard Seguin, Ont., Can. . . . Norman L. Whiteley, Linwood, Pa. . . . R. G. Agnew, Toronto, Ont., Can. . . . P. D. Liddell, Fairfield, Ala. . . . Charles J. Miller, Westville, N. J. . . . Ned F. Britton, Memphis, Tenn. . . . Ariel H. Freund, Elmhurst, Ill. . . . Ken Marwin, Clawson, Mich. . . . Maynard L. Guilford, Mountain View, Calif. . . . Henry C. Elliott, Georgetown, S. C. . . . Gus Pivano, Union City, N. J. . . . Edward Soltis, Yonkers, N. Y. . . . Roger E. Stiles, Clinton, Okla. . . . Joseph W. Scheld, Ansonia, Conn. . . . Glen Harnishfeger, Fort Wayne, Ind.

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A New Pill That Helps You Quit Smoking

Science at Last Tells You What to Do if You Want to Stop Smoking

By George Clark

THE INABILITY to give up smoking is one of the more curious idiosyncrasies of 20th century man. Ever since Sir Francis Drake in 1586 brought tobacco back to England from Virginia and the habit of smoking was reimported to America by the Pilgrim fathers, the "noxious weed," as an eminent Victorian referred to it, has had half the world in its grip.

There are signs that this grip is at last being loosened. It is being loosened by a harmless little white pill. The story of how this little white pill was discovered is a curious one.

In 1947, doctors composing a research team at Chicago's Loyola University, set out to study gingivitis, a rather unpleasant inflammation of the gums that bedevils mankind. It had long been theorized that smoking contributed to this inflammation. But would stopping smoking help? In true scientific fashion our researchers decided that half of their patients should stop smoking to see if they showed any improvement over the other half.

But what could they give a patient that would help him to stop smoking quickly and easily? Up to that time medical experience showed that there was no easy, pleasant way to stop smoking. Years before, some experimental work had been reported with a drug called Lobeline Sulphate. This curbed the desire to smoke; but in doses large enough to be effective, it produced various unpleasant side effects. Here at least was a starting point.

Soon the tail was wagging the dog and the project of finding a way to help people conquer the tobacco habit had become the all-important problem. After months of research and experimentation, our scientists hit upon the solution. The addition of two common antacid ingredients to Lobeline Sulphate accomplished two things. First, any unpleasant side effects were eliminated; secondly, the amount of Lobeline Sulphate necessary to do an effective job was greatly reduced. The result was a harmless little white pill which, when given to test patients, enabled them to stop smoking in 5 days!

What made it work? Lobeline Sulphate is extracted from the Lobelia plant which is sometimes called "Indian Tobacco." It is a first cousin to nicotine, mimicking its action but without its harmful effects. It works by removing the craving for nicotine in the system and not by making smoking unpleasant or intolerable.

The footnote to this story is an interesting one. It turned out that smoking did irritate the gum tissues. Those gingivitis patients who, with the help of the little pill, stopped smoking, showed a marked improvement over the smoking half.

And of course there was a sequel. The university realized that in this little pill they had something that thousands longed for. Here was something that would really help anybody who wanted to free him or herself from the smoking habit. More research was carried on, more tests were made on hundreds and hundreds of patients. It was proved that 83%, more than 4 out of 5, of all people who wanted to stop smoking, could do so easily and pleasantly in five to seven days with the help of the little pills. Significantly, it was found that those who didn't stop completely had cut down their smoking drastically.

This new discovery was soon reported in medical journals; demand for it came overnight from every corner of the globe. The Campana Company of Batavia, Illinois, was chosen to market these amazing pills. Today you can buy them at any drug store in the United States, under the name of *Bantron*, for only $1.25 a box. They are also available in Canada. Bantron has been proven so safe, it can actually be bought without a doctor's prescription.

Of course, Bantron can't do *all* the work for you alone. It will not tie your hands behind your back. But if you really want to stop or cut down smoking, it can be a powerful helper.

As Capt. Roger Don Rae, a senior pilot for TWA, said: "I used to smoke all the time. I just couldn't stop. Then one day I heard about Bantron. With the help of Bantron, I stopped smoking in a few days. Today I am free of the habit."

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will not keep you as warm as will two thin, closely-woven shirts.

Cotton pants have no place in your duffle bag for early-season trips. Thick woolen pants, such as are sold by J. C. Penney, L. L. Bean, Montgomery Ward and Sears, Roebuck are the ticket.

More important than any of the above, to the wader, is his footgear. Many a man has broken a leg in boots that were wrong for wading slippery bottoms and swift currents. Rubber soles, even the ribbed or cleated ones, are villainous except on muddy or sandy bottoms. Felt is the only thing that actually clings to slippery rocks. Felt-soled waders are expensive, but so are broken bones. Not to mention fishing trips ruined because you can't wade out to the best holes.

Felt-soled waders come in two styles: stocking-foot and boot. I prefer the stocking-foot type because with a pair of these you can have two pairs of wading shoes, one with felt soles and the other with cleated rubber soles. Then you're ready for anything. With the rubber soles you can even wear chains—for moss-covered rock bottoms.

Seven out of ten anglers seem to forget that it sometimes rains. It's silly to pay $15 a day to sit around in a fishing camp because it's raining, when you could be out fishing in comfort. For wading you need a rubberized rain jacket that slips over your shirts and ties at the waist—outside your waders. For boat or bank fishing a hooded rain shirt of pure rubber that goes clear down to the ankles is excellent. It should zip up the front and have huge pockets for tackle and other necessaries.

For bank fishing you'll need a pair of knee-length rubber boots. In a boat you'll find that a pair of L. L. Bean's rubber boat shoes are best.

The weather where you fish is apt to be quite different from the weather where you live, and wherever you plan to go in April, the clothes that kept you comfortable last August will prove unseasonable. This seems to be something that very few anglers can get through their noggins. You be the smart one this year; go prepared for the worst while you hope for the best.

Good luck now, and happy, comfortable fishing. •

I Rode An Atomic Sub

[*Continued from page* 80]

come tumbling down.

The food is delicious! Here's the lunch I devoured: pork chops with peas and potatoes, plenty of tasty bread and butter, superb Navy coffee, milk and ice cream. All bread is baked aboard the boat and the ice cream also is homemade. The mess is open 24 hours a day and a sailor can fix himself a snack anytime he likes.

Muscular John Novak of Antigo, Wis., was shaving in one of the heads as we passed by. He showed us the layout which includes a shower, two heads with doors for privacy, two urinals and two wash basins which fold up against the wall. Waste here is also expelled into the sea.

The *Seawolf* carries a complement of about 89 men and 12 officers. The officers sleep in tiny two-bunk cabins off the wardroom—with the exception of the Captain who has a 6x7-foot cubicle to himself. Bunks for the crew are scattered throughout the boat. They hang on the bulkheads in tiers of four, each with a small reading lamp. We found Electrical Technician Ted Parke reading in his bunk on a four-inch thick foam rubber mattress. He said, "It's comfortable and has plenty of room" when I remarked it looked rather cramped.

The officers' wardroom and sleeping quarters and the crew's mess are decorated in pleasing pastel colors. The four 60-ton air-conditioning units aboard keep the temperature a shade below 70° F. at all times. There's a clean-smelling odor down there that reminded me of a new air-conditioned railroad car.

For submarine men boredom is the big problem. The *Seawolf* is submerged most of the time at sea and the crew works a monotonous four-hours-on, eight-hours-off shift around the clock. Movies are shown in the crew's mess every night. The men also play chess, checkers and cards. Lieutenant Bob Crispin, Propulsion Officer, keeps an Exercycle in his locker to help him stay limber. A hobby shop is in the tool room in the tail of the boat where spare parts are kept.

Up in the attack center, just below the conning tower, we watched three sailors seated abreast control the boat. The port-

[*Continued on next page*]

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side man steers; the one in the middle controls the stern planes; the starboard-side man operates the bow planes which fold up and hug the sides of the boat when it is surfaced.

Since an atomic submarine's power plant furnishes its own atmosphere and requires no outside oxygen, it can stay submerged indefinitely. The *Seawolf* has already remained below for 16, 30 and 60-day periods without surfacing.

The *Seawolf* displaces about 3,200 tons and is some 330 feet long, slightly larger than the *Nautilus*, the first U.S. atomic submarine. The *Seawolf* was built by General Dynamics Corp. and is currently in dry dock where her experimental sodium-cooled reactor is being replaced by a pressurized water-cooled plant like that of the *Nautilus*.

The U.S. Navy has already commissioned ten atomic-powered submarines and 23 more have been authorized. The *Seawolf* will be a veteran of this coming nuclear fleet. She and her officers and crew are pioneering nuclear propulsion—the fantastic power that promises to make Diesel-powered ships of all classes obsolete.

After a full day aboard the "Wolf," as the men call her, we surfaced at Groton, Conn. I walked down the gangplank convinced that the U.S. Navy's atomic submarines will be tough to beat. If the *Seawolf* is a sample of Uncle Sam's growing undersea might, we're going to be top dog for a long time to come. •

Learn From Uncle Sam

[*Continued frompag e* 75]

recap of all recently-issued booklets pertaining to a particular subject.

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Below: eight of the most popular publications ever issued by the Superintendent of Documents. Catalog numbers and prices are shown after each listing.

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2. *Light Frame House Construction.* Separate chapters on foundation sills and girders, columns, joists, bridging, walls, partitions, roofs, floors, sheathing, siding, shingles, interior trim, chimneys, porches, steps and other miscellaneous items. (FS 5.123:145)—60 cents.

3. *Woodworking And Furniture Repair.* Covers construction of the more common types of furniture and includes description of tools and techniques used in furniture repair. Separate chapters on glue and gluing technique, upholstered furniture,

[*Continued on next page*]

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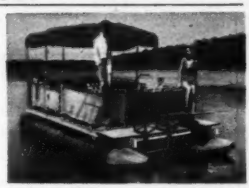

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Those are just a few of the instructive and valuable booklets offered by Uncle Sam. It's a lot of education for very little cash!

A Safer Racing Car

[*Continued from page* 96]

dubious future:

1. The rules of all racing associations should be amended to establish a *minimum* weight limit for specially built cars.

2. Roll bars and frame members in all cars should be greatly extended and strengthened for driver safety.

3. Frames must be designed to give fuel tank protection.

4. Provide nerfing bars (bumpers) at front and rear for protection in the event of guard rail contact.

5. Rollers set into front and rear bumpers would help prevent wheel-climbing in case of contact between two cars.

6. Develop adjustable ailerons to compensate for weight loss as fuel is consumed. Present cars weigh 250 lbs. less after 100 miles of running. Adjustable ailerons would improve stability and help keep the car on the track, much as trim tabs allow a pilot to keep his plane level.

7. Take a tip from the aircraft industry and install bird-proof windshields.

8. Install carbon dioxide tanks in the frame with nozzle outlets in engine and fuel compartments to operate either automatically or manually in case of a fire.

9. Carry a gallon of water to spray the driver in case of fire. The water could be under pressure from the carbon dioxide carried in the frame tanks.

10. Construct fuel tanks from welded steel lined with synthetic rubber or glass fiber to help prevent tank ruptures.

As an additional big step toward maximum driver protection, I suggest that drivers be given as long a time as possible to familiarize themselves with the cars they are to race, to practice and learn the characteristics of the machines in which they risk their lives.

Even with these suggested improvements, drivers will continue to be injured and cars will continue to crackup in the high-speed races we have today. But I feel these are the *minimum* precautions that must be taken to develop a safer racing car so that auto racing in America may continue to earn new friends.

As a reward to the driver and carbuilder who develop a faster, better-handling car, the management of the Daytona International Speedway has posted a prize of $10,000 for the first driver to lap the 2½-mile track at 180 mph. The Speedway management wants the driver to live to collect it! —*Bill France*

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Now: New Living TV Viewing

There is something that will help. Think of it! For years you've had to see washed out hazy pictures on your TV screen but now you can use an antenna that's not 3, not 30, but hundreds of feet long. Now don't get alarmed. Your antenna is already in your house. The wires in the walls will give your TV a boost you want and need so badly. All you need to put your house wiring to work for you is a little time, about two minutes. One magnificent simple device called **TV BOOSTER** can do this for you at an amazing low price of $4.95. **Use the wires in the walls of your home or apartment to boost your TV reception.**

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It works on any year, make or model TV set ever made. We guarantee you must be 100% satisfied or you get every cent back! It must boost your TV reception or your money back.

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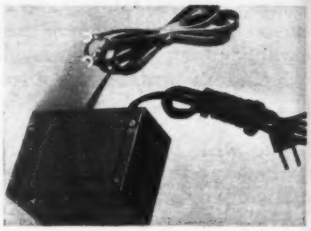
To connect the **TV BOOSTER** to your set takes only about 2 minutes and a screwdriver. You don't even get your hands dirty. You simply plug it into the nearest electric socket and connect its wires to your set and it's connected **forever**—anyone can do it. Just unscrew your present antenna wires. Slip on the wires of **TV BOOSTER** and plug in its cord. Use your TV antenna and your **TV BOOSTER.** Now turn on the weakest channel, try reversing the plug and leave it in the socket in the way you get the clearest brightest picture. That's all there is to it! Every other channel will show you an amazing difference from pictures you have seen before—you will enjoy better sound, and more living pictures than you have ever seen before. You'll begin to enjoy living TV better than you've ever dreamed possible or you get every cent back. Try it—you are the sole judge. Your money back if not thrilled with results.



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Rush my **TV BOOSTER** to try at your risk. I must be 100% satisfied or I can return it after a full week's trial and get my money back—I am to be the sole judge. I enclose $4.95 cash, check or M.O., send postage prepaid. (I save up to 75c postage by sending full payment with my order.) I must be delighted with the reception of every single channel in my area or I get my money back.

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HE JUST DOESN'T HAVE IT!

I OVERHEARD THE BOSS TALKING ABOUT ME — FRANK SMITH! THE WORDS HURT. BUT DEEP DOWN I KNEW THEY WERE TRUE.

THAT NIGHT I FELT DESPERATE. THEN MY WIFE SAID SOMETHING THAT CHANGED MY WHOLE LIFE!

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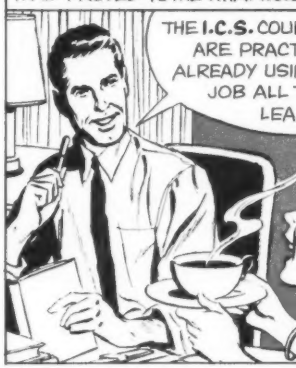

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- ☐ Chem. Lab. Technician
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- ☐ Highway Engineering
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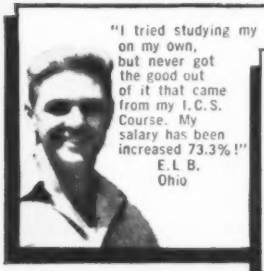

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Any cure for spring fever

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SYMPTOM: Daydreams like this—

You feel a new warmth in the spring sun. A soft wind riffles the water. The gentle hum of your Evinrude is punctuated by the whir of your reel.

Somewhere below, the "grandaddy" of this lake moves with a lazy rhythm.

Then it happens! The water erupts! You strike, reel in . . . every nerve geared to the taut line and the fighting demon on the other end!

That's spring fever. But, why try to cure it? Relax and enjoy it! Best way to do that is a trip to your Evinrude dealer.

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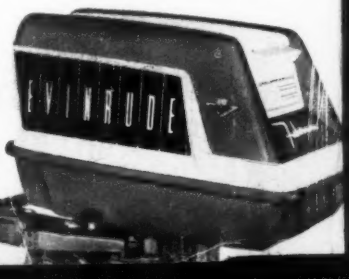
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